Exhibit A

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SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

PEOPLE OF THE STATE OF NEW YORK, By LETITIA JAMES, Attorney General of the State of New York Plaintiff, v. EXXON MOBIL CORPORATION, Defendants.	Index No. 452044/2018

EXPERT REPORT OF PETER M. BOUKOUZIS
MAY 8, 2019

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I. INTRODUCTION

A. Qualifications

1. My name is Peter Boukouzis, and I am the business chair and assistant professor of business at the University of Saint Katherine. Additionally, I provide consulting services on a variety of strategic matters, including valuations, mergers and acquisitions, business development, and ongoing litigation. I have a Bachelor of Science in Chemical Engineering from the University of Illinois at Urbana/Champaign and a Masters of Business Administration with concentrations in accounting, economics, and finance from the University of Chicago's Booth School of Business.

2. I am a former senior energy mergers and acquisitions ("M&A") investment banker with 18 years of investment banking experience, primarily in the oil and gas sector. In my most recent position, I led U.S. energy M&A for BMO Capital Markets Corp. ("BMO"), from which I retired in 2016. At BMO, I also served as a member of the firm's fairness committee where I was part of a team that reviewed the analytics and authorized the release of fairness opinions for M&A transactions. Before BMO, I worked for Rothschild Inc. from 2001 to 2009. Prior to working as an investment banker, I was employed as a chemical engineer for oil and gas and oil refining companies, including Conoco, Inc., Pacific Refining Company, and Clark Refining and Marketing.

3. I have experience with transactions encompassing the entire value chain of the oil and gas industry, including oil and gas exploration and production, crude oil and natural gas transportation, crude oil refining, refined product transportation and distribution, and retail gasoline.

4. In my roles as an investment banker and a chemical engineer in the oil and gas industry, my duties included, *inter alia*, assessing the public market dynamics and investor sentiment of oil and gas companies, performing analyses regarding companies' shareholdings, financial modeling, and the valuation of oil and gas companies.

5. As an M&A investment banker, one of my responsibilities was to monitor and evaluate the public markets for and public market perception of oil and gas companies. This task involved the analysis of a wide range of oil and gas industry reports and equity research analyst reports to evaluate their individual and collective views of both specific oil and gas companies and the oil and gas industry as a whole. My responsibilities also involved researching the disclosures of individual oil and gas companies, which included reviewing items such as financial statements, documents filed with the Securities and Exchange Commission, press releases, earnings calls, investor presentations, and news releases. In addition, in the context of an M&A transaction, utilizing publicly available information I analyzed the current and historical shareholder bases of public companies, noting changes in their holdings over time to estimate the potential entry basis of their holdings through analysis of market and trading data.

6. During my 18 years as an M&A investment banker and also subsequently as a consultant, I constructed, modified, and reviewed hundreds of financial and operating models, including models related to the oil and gas industry. These models included net present value ("NPV") analyses, three-statement financial models combining the income statement, balance sheet, and statement of cash flows, oil and gas company operating and financial cash flow models, oil and gas project operating and financial cash flow models, statistical calculations and regressions, and budgets and forecasts.

7. Over the course of my career, these models formed the basis of project and company valuations, including fairness opinions vetted by the fairness committees of my employers, and the acquisitions, divestitures, and mergers of companies, divisions, and assets involving both public and private companies with potential transaction values ranging from approximately $5 million to approximately $90 billion. These valuations utilized multiple primary valuation methodologies such as discounted cash flow analysis, net asset value analysis, comparable companies analysis, precedent transactions analysis, and discounted distribution analysis.

8. A copy of my curriculum vitae, which provides additional details of my professional background, is attached to this report as **Appendix A**.

B. Summary of Allegations

9. The People of the State of New York ("Plaintiff") alleges that Exxon Mobil Corporation ("ExxonMobil") provided false and misleading statements to its investors, industry analysts and the broader investment community (collectively, the "Investment Community") regarding its management of "economic risks posed to its business by the increasingly stringent policies and regulations that it expects governments to adopt to address climate change."[1] Plaintiff further alleges that "instead of managing those risks in the manner it represented to investors, ExxonMobil employed internal practices that were inconsistent with its representations, were undisclosed to investors and exposed the

[1] Complaint, *People of the State of New York v. Exxon Mobil Corporation*, Index No. 452044/2018, October 24, 2018 (hereafter, "Complaint"), p. 1.

company to greater risk from climate change regulation than investors were led to believe."[2]

10. According to the Complaint, to simulate the impact of climate change regulations, ExxonMobil claimed to apply publicly disclosed "proxy costs" for greenhouse gas ("GHG") emissions[3] from its business operations in its business planning, investment decisions, assessment of its oil and gas reserves and resource base, evaluation of long-term asset impairment, and estimates of future demand for oil and gas.[4,5] However, despite recognizing internally that its publicly disclosed GHG Emission Proxy Cost was likely to more accurately reflect the risk of future climate change regulations, ExxonMobil instead, in almost all years, applied a lower or no GHG Emission Proxy Cost in its financial projections and assessments. Specifically, the Complaint alleges that ExxonMobil's representations regarding its adoption of a GHG Emission Proxy Cost deviated from its internal practices in the following manner:[6,7]

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2 Complaint, p. 1.

3 GHG are gases that trap heat in the atmosphere and contribute to climate change. Carbon dioxide ("CO_2") makes up around three-quarters of GHG emissions followed by methane at 17 percent. In this report, I use the term "GHG Emissions" to refer to both CO_2 and other GHG emissions. *See* Ritchie, Hannah and Max Roser, "CO_2 and Other Greenhouse Gas Emissions," https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions.

4 Hereafter, I use the term "GHG Emission Proxy Cost" to refer generally to both ExxonMobil's publicly-disclosed proxy cost and the internal proxy cost it used to estimate the projected cost of GHG Emissions from its business operations and the consumption of oil and gas products by end users.

5 Complaint, pp. 1-2.

6 Complaint, pp. 2-3.

7 The Plaintiff also alleges that, prior to 2016, ExxonMobil did not apply a GHG Emission Proxy Cost in evaluating whether long-lived assets were impaired. I understand that Plaintiff's expert Professor Eli Bartov will opine on whether ExxonMobil omitted the GHG Emission Proxy Cost from its impairment testing prior to 2016 and whether and to what extent ExxonMobil would have incurred impairment losses if it had included the GHG Emission Proxy Cost in its 2015 impairment model for its Mobile Bay asset. *See* Expert Report of Eli

- In its investment decisions, business planning, and assessment of company's oil and gas reserves, ExxonMobil for many years applied either "(i) a lower, undisclosed [GHG Emission Proxy Cost] contained in internal corporate guidance; (ii) an even lower cost based on existing regulations held flat for decades into the future, in lieu of any [GHG Emission Proxy Cost]; or (iii) no cost associated with GHG [E]missions at all."

- In its demand projections for oil and gas, ExxonMobil did not apply "[a GHG Emission Proxy Cost] to the transportation sector, which accounts for more than half of worldwide demand for crude oil."

- ExxonMobil's representation that its business faced little risk under the "two degree scenario" "compared to pre-industrial levels" was based on assumptions that were "unreasonable and unsupported" by sources relied on for the analysis.[8]

C. Assignment

11. I have been retained by the Plaintiff to provide expert analysis and testimony in the above-captioned action. Specifically, I have been asked to:

- Opine on the factors that are considered by the Investment Community in evaluating oil and gas companies such as ExxonMobil, particularly the risks faced by such companies due to climate change regulations, and the importance of accounting for such risks in business planning and investment decisions of such companies;

- Evaluate the extent to which ExxonMobil's public disclosures regarding its management of economic risks posed by climate change regulation and policies over the relevant period[9] in this matter factored into the Investment Community's evaluation of the company;

- Evaluate whether ExxonMobil appropriately applied its publicly disclosed GHG Emission Proxy Cost in its projections of fuel demand for the overall oil and gas industry;

Bartov, *People of the State of New York v. Exxon Mobil Corporation*, Index No. 452044/2018, May 8, 2019 (hereafter the "Bartov Report").

8 The two degree scenario refers to a scenario "in which the production and consumption of fossil fuels is severely curtailed in order to limit the increase in global temperature to below two degrees Celsius compared to pre-industrial levels." Complaint, p. 3.

9 For purposes of this report, I have focused on 2010-2017 as the relevant period unless otherwise noted.

- Evaluate whether ExxonMobil appropriately applied its publicly disclosed GHG Emission Proxy Cost in making corporate planning and investment decisions for a set of oil and gas assets, and estimate the impact on the projected cash flows from those assets in cases where publicly disclosed GHG Emission Proxy Cost were not properly applied; and

- Calculate the potential number of shares held by ExxonMobil's institutional shareholders that were negatively impacted by ExxonMobil's alleged misrepresentations regarding its application of publicly disclosed GHG Emission Proxy Cost, and estimate the potential aggregate damages suffered by ExxonMobil's shareholders due to ExxonMobil's alleged misrepresentations.

12. In preparing this report and forming my opinions in this matter, I have relied on my experience as an investment banker and as a chemical engineer in the oil and gas industry. I have also reviewed and considered documents and other materials produced in this matter or obtained from public sources. These materials include analyst and industry reports, publicly available financial data, shareholder proposals for ExxonMobil and its peer companies, public disclosures made by ExxonMobil and its peer companies regarding climate change risk, publicly available news articles, ExxonMobil's financial statements and filings, ExxonMobil employee interview and deposition transcripts, internal corporate planning and investment decision financial models, the Bartov Report, and other internal documents produced in this matter. A complete list of sources that I have considered in forming my opinions in this matter is provided in **Appendix B**. I may amend or supplement my opinions and report, if appropriate, based on any additional discovery, or in response to opinions or reports of other experts in this matter.

13. The current hourly rate for my work is $825. Of this amount, I receive $620 per hour. Eleven Canterbury, a firm that handles the administrative work associated with this engagement, receives $205 per hour. Some of the analysis underlying my conclusions in this report was performed by others working under my direction and supervision. Neither

my compensation nor that of my support team is contingent upon my findings, the testimony I may give, or the outcome of this litigation. My work in this matter is ongoing, and I reserve the right to supplement my analysis and opinions should more information become available to me and/or in response to any report submitted on behalf of the Defendant in response to my analysis and opinions.

II. SUMMARY OF OPINIONS

14. In recent years, governments around the world have begun to introduce commitments and regulations to address threats posed by climate change. Many policymakers and industry observers expect these regulations to become increasingly stringent in the coming years.

15. The oil and gas industry, in particular, is GHG Emission-intensive and therefore faces significant risk from such climate change regulations ("Climate Change Regulatory Risk"), which are likely to affect the cash flows, growth, and investment returns of oil and gas companies such as ExxonMobil. The Investment Community has become more cognizant of these risks and considers Climate Change Regulatory Risk as a relevant factor in their assessment of potential investments, particularly investments in oil and gas companies. Moreover, recognizing such risks, many investors in the industry have been trying to reduce their investment exposure to Climate Change Regulatory Risk or encourage the companies in which they invest to actively manage their own exposure to these risks.

16. ExxonMobil's oil and gas business and investments involve long-term GHG Emission-intensive assets that are likely to face significant Climate Change Regulatory Risk.[10] ExxonMobil itself has consistently acknowledged the need to account for the costs and impacts Climate Change Regulatory Risk would have on its business and has represented to the Investment Community through its public disclosures that it uses a GHG Emission Proxy Cost in its business planning and investment decision processes. Shareholder proposals and commentaries by the Investment Community over the relevant period indicate that ExxonMobil's public disclosures regarding its management of Climate Change Regulatory Risk formed a basis for the Investment Community's evaluation of ExxonMobil.

17. I have reviewed how ExxonMobil accounted for Climate Change Regulatory Risk and costs associated with GHG Emissions in its fuel demand projections for the oil and gas industry, and its corporate planning and investment decision financial models. Based on this review, I find that ExxonMobil's practices of accounting for Climate Change Regulatory Risk and GHG Emission costs were inconsistent with its public disclosures regarding these risks and costs.

18. As part of its annual "Energy Outlook" planning process, ExxonMobil projected the GHG Emission Proxy Cost and the total end user fuel demand for the overall global oil and gas industry. Based on this process, ExxonMobil then disclosed its view about the

[10] For example, I understand that Professor Bartov has concluded based on his analysis that "[h]ad ExxonMobil included GHG Emission Proxy Costs in its cost projections for its 2015 impairment testing of Mobile Bay, it would have concluded that the book value of Mobile Bay was not recoverable based on the project's remaining net undiscounted cash flows, and consequently recognized an after-tax impairment loss of $320 million to $478 million." Bartov Report, ¶16.

GHG Emission Proxy Cost and future fuel demand for the overall global oil and gas industry to the Investment Community in its annual "*Outlook for Energy*" reports. However, in its internal demand projections for the overall global oil and gas industry, ExxonMobil did not consistently apply the GHG Emission Proxy Cost that it publicly disclosed.

19. Specifically, in evaluating the projected end user demand from the transportation sector, ExxonMobil did not directly apply any GHG Emission Proxy Cost, as it did for the other non-transportation sectors where it added the GHG Emission Proxy Cost to the fuel price assumptions it used to project demand. Instead, in the light duty segment, ExxonMobil only considered potential vehicle fuel efficiency standards that vehicle manufacturers may be required to meet, and in other segments such as heavy duty vehicles, aviation, marine, and rail, it only considered anticipated fuel efficiency improvements. This approach was inconsistent with ExxonMobil's public representations and ignored the fact that the end users in the transportation sector could also face higher fuel prices due to GHG Emission costs. If it had consistently applied the GHG Emission Proxy Cost to its demand projections in the transportation sector, ExxonMobil would have projected lower end user demand for oil products from the sector. Additionally, given the fact that the transportation sector is expected to represent more than half of the worldwide demand for crude oil, ExxonMobil's failure to appropriately account for fuel demand in this sector would likely also have had a substantial impact on its overall global crude oil demand projections. Since ExxonMobil states that it uses these demand projections to inform its business planning and investment decisions, by projecting an inflated outlook for global fuel demand ExxonMobil consequently also likely inflated the demand for its products.

Such inflated projections would have likely positively biased the Investment Community's assessment and valuation of ExxonMobil.

20. Furthermore, based on my years of experience analyzing and valuing oil and gas companies, ExxonMobil's public disclosures related to its GHG Emission Proxy Cost would have likely led the Investment Community to conclude that the company was applying the publicly disclosed cost consistently in its corporate planning and investment decisions in the geographies where it expected increasingly stringent climate change regulations. However, based on my review of ExxonMobil's financial models, ExxonMobil's actual practices in many cases were contrary to its public representations. Specifically, in the financial models used for corporate planning and investment decision processes that I reviewed, ExxonMobil applied either a GHG Emission Proxy Cost that was lower than ExxonMobil's publicly disclosed costs or no GHG Emission Proxy Cost at all for the GHG Emissions it projected for the vast majority of the assets or investments.

21. To demonstrate the potential impact of ExxonMobil's inconsistent application of its GHG Emission Proxy Cost, I reviewed a set of 72 of ExxonMobil's financial models and, where possible, adjusted the estimated GHG Emission costs in these models by applying ExxonMobil's publicly disclosed GHG Emission Proxy Cost.[11] For the 27 models that I was able to adjust, my analysis shows that applying GHG Emission Proxy Cost estimates

[11] As part of these adjustments, for 5 models where ExxonMobil only calculated the GHG Emission Proxy Costs for a portion of the total projected GHG Emissions for a given asset, I applied the GHG Emission Proxy Cost to the entirety of the projected total GHG Emissions.

that were publicly disclosed instead of the estimates based on internal guidance or then-existing regulation has a significant impact on the total projected undiscounted cash flows, NPV and Internal Rate of Return ("IRR").[12] In aggregate, applying the publicly disclosed GHG Emission Proxy Costs to these 27 models reduced the projected total undiscounted cash flows by $70 billion (i.e., 7.2 percent), total NPV by $5 billion (i.e., 3.9 percent) and the average IRR by 0.6 percentage points.[13]

22. Such a reduction in projected cash flows and returns for ExxonMobil's assets demonstrates that by not consistently applying its publicly disclosed GHG Emission Proxy Cost in its project economics, ExxonMobil inflated the outlook for its business. In particular, many of the projects with the largest impact from the corrections are ExxonMobil's oil sands projects, such as Kearl and Firebag. Oil sands account for a significant portion of ExxonMobil's total oil and gas reserves, are GHG Emission-intensive, and have low margins, making them particularly vulnerable to Climate Change Regulatory Risk. Given ExxonMobil's representations regarding GHG Emission Proxy Costs, the Investment Community likely assumed that GHG Emission Proxy Costs were already being incorporated into the project economics for such assets. This could have caused the Investment Community to unknowingly assume the risk that low margin

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[12] Another name for IRR is the discounted-cash-flow rate of return ("DCFR"). ExxonMobil uses the term DCFR to refer to IRR in its financial models. *See, e.g.*, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance*, 10th ed., 2011, p. 108.

[13] I note that for 18 models, ExxonMobil did not explicitly apply a GHG Emission Proxy Cost or project any GHG Emissions for the underlying assets. As a result, I was unable to adjust these models for the omission of the GHG Emission Proxy Cost. In addition, the 27 models for which I was able to apply the publicly disclosed GHG Emission Proxy Cost represent only a subset of the universe of ExxonMobil projects and assets. Thus, my analysis likely understates the impact from ExxonMobil's alleged misrepresentation regarding its adoption of a GHG Emission Proxy Cost.

assets with high GHG Emissions such as oil sands would become uneconomic and stranded once this GHG Emission Proxy Cost was included. Based on my professional experience, such an inflated outlook, in turn,would have likely positively biased the valuation of ExxonMobil. If, in contrast, ExxonMobil had consistently accounted for the GHG Emission Proxy Cost as it publicly represented, ExxonMobil's Management Committee should have been presented less optimistic business projections and investment economics, including reductions in the returns from its assets. Then, the Management Committee would have communicated this less optimistic outlook to the Investment Community, and would not have biased up the Investment Community's assessment and valuation of ExxonMobil.

23. Additionally, I was asked by counsel to calculate the potential number of ExxonMobil shares that were negatively impacted and estimate the potential aggregate damages suffered by ExxonMobil's shareholders resulting from the company's alleged misrepresentations regarding its adoption of GHG Emissions Proxy Costs. I analyzed the institutional shareholder data for ExxonMobil and utilized the impact per share that the disclosure of ExxonMobil's alleged misrepresentations had on its stock price (*i.e.,* "inflation") estimated by Professor Bartov to estimate the potential aggregate damages to ExxonMobil's shareholders.[14] In aggregate, I estimate the damage to ExxonMobil shareholders range from $476 million to $1.60 billion, depending on the inflation per share estimate used. Because my analysis only considers the quarterly shareholding for institutional shareholders for which I have publicly available data and ignores

[14] *See* Bartov Report, ¶16 and Section V.D.

institutional or non-institutional shareholders and likely a portion of those institutional shareholders for which I have no data, my estimate of potential aggregate damages likely understate the total damages suffered by all ExxonMobil shareholders due to the alleged misrepresentations. Additionally, as I use the quarterly institutional shareholding data, my analysis also does not take into account any intra-quarter change in shareholdings or trading within a given individual institution, which also likely results in an understatement of the total damages suffered by all ExxonMobil shareholders due to the alleged misrepresentations.

III. OVERVIEW OF THE OIL AND GAS INDUSTRY, EXXONMOBIL, AND KEY CLIMATE CHANGE REGULATIONS

24. In this section, I begin by providing an overview of the oil and gas industry in which ExxonMobil operates, ExxonMobil's business, and the recent key climate change regulations. This background provides the backdrop in which ExxonMobil operates and context for the discussion in the remaining sections of the report regarding ExxonMobil's disclosure and management of Climate Change Regulatory Risk.

A. Overview of the Oil and Gas Industry

25. The oil and gas industry is one of the most important segments of the global economy.[15] In 2018, five of the top 10 global companies by revenue were oil and gas companies.[16]

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15 "Global Oil Industry and Market - Statistics & Facts," Statista, https://www.statista.com/topics/1783/global-oil-industry-and-market/.

16 "Global 500," Fortune, http://fortune.com/global500/.

Additionally, in the same year, natural gas and crude oil accounted for approximately 63 percent of global energy production and about 67 percent of global energy consumption.[17]

26. Both global oil consumption and supply have been growing over the past several years, increasing by 5 percent and 4 percent between 2014 and 2017, respectively.[18] The U.S., China, and India have been the most significant contributors to the growth in global oil consumption.[19] On the supply side, rapid growth in production from non-OPEC countries, including the U.S., has driven the increase in global supply.[20] In fact, over the period 2006 to 2016 only Iraq had a higher oil production growth rate than the U.S., which grew at 6.1 percent per annum compared to the OECD overall oil production growth rate of 1.8 percent per annum.[21]

27. Demand for oil may not, however, continue to grow in the future, and may even begin to decline.[22] As I discuss in the sections below, as governments enact policies discouraging

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17 "Monthly Energy Review: Tables 1.2 and 1.3," U.S. Energy Information Administration ("EIA"), April 2019, pp. 5-7, https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf.

18 Global demand for oil increased from 93.1 million barrels per day to 97.8 million barrels per day between 2014 and 2017. Global supply of oil increased from 93.6 million barrels per day to over 97.4 million barrels per day during the same period. "Oil Market Report: Table 1," International Energy Agency ("IEA"), March 15, 2018, p. 1, https://www.iea.org/media/omrreports/tables/2018-03-15.pdf.

19 "Global Energy & CO2 Status Report," p. 3, IEA, 2018, https://www.iea.org/geco/oil/.

20 Cooper, Amanda, "Global Oil Supply to Swamp Demand in 2019 Despite Output Cuts: IEA," Reuters, February 13, 2019, https://www.reuters.com/article/us-iea-oil/global-oil-supply-to-swamp-demand-in-2019-despite-output-cuts-iea-idUSKCN1Q20WK.

21 "BP Statistical Review of World Energy," BP, June 2018, p. 14, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf.

22 *See, e.g.*, Cunningham, Nick, "Bank of America: Oil Demand Growth to Hit Zero within a Decade," Oil Price, February 5, 2019, https://oilprice.com/Energy/Energy-General/Bank-Of-America-Oil-Demand-Growth-To-Hit-Zero-Within-A-Decade.html. *See also* discussion in Section VI.A.1.

GHG emissions, consumers are likely to demand less oil and more fuels with lower GHG Emissions such as natural gas.[23] With this in mind, some industry participants predict that oil demand growth rates will slow in the coming decades, with those rates actually becoming negative among OECD countries.[24]

28. Global consumption and supply of natural gas have already been rising, increasing by 7 percent and 6.2 percent between 2014 and 2017, respectively.[25] The U.S. was the largest driver of higher natural gas consumption.[26] On the supply side, in 2017, the U.S. and OECD countries as a whole accounted for approximately 20 percent and 36 percent of the total production, respectively.[27]

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23 *See, e.g.*, Davis, Carolyn, "Worldwide Natural Gas Consumption to Overtake Oil by 2026, Says DNV GL," September 10, 2018, https://www.naturalgasintel.com/articles/115725-worldwide-natural-gas-consumption-to-overtake-oil-by-2026-says-dnv-gl. *See also* "The Natural Gas Gamble: a Risky Bet on America's Clean Energy Future (2015)," The Union of Concerned Scientists, https://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/natural-gas-gamble-risky-bet-on-clean-energy-future.

24 "World Oil Outlook 2040," Organization of the Petroleum Exporting Countries, 2017, pp. 13-14 https://www.opec.org/opec_web/flipbook/WOO2017/WOO2017/assets/common/downloads/WOO%202017.pdf.

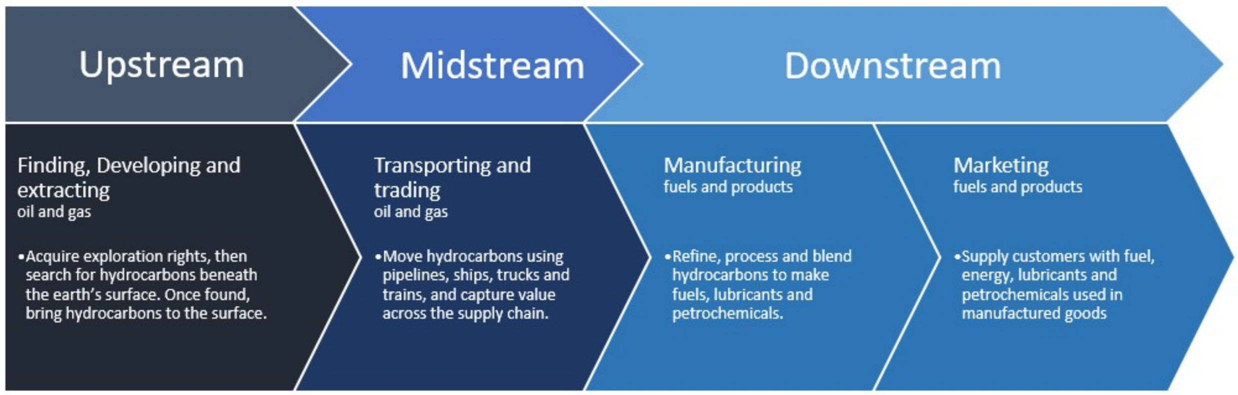
25 Global demand for natural gas increased from 3.51 trillion cubic meters to 3.76 trillion cubic meters between 2014 and 2017. Global supply of natural gas increased from 3.55 trillion cubic meters to over 3.77 trillion cubic meters during the same period. "Natural Gas Statistics," IEA, https://www.iea.org/statistics/naturalgas/.

26 "Global Energy & CO2 Status Report," IEA, 2018, https://www.iea.org/geco/gas/.

27 The U.S. was responsible for 734.5 billion cubic metres, and OECD countries were responsible for 1313.6 billion cubic meters out of a total of 3680.4. "BP Statistical Review of World Energy," BP, June 2018, p. 28, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf.

29. As shown in Figure 1 below, the oil and gas industry is often divided into multiple segments, with many companies specializing in a particular segment and others, such as ExxonMobil, operating across multiple segments. GHGs are emitted in every segment.[28]

Figure 1: Overview of the Oil and Gas Industry[29]



a. **Exploration and Production ("E&P" or "Upstream"):** Companies operating in this segment explore for crude oil and natural gas reserves, develop oil and gas fields, and extract crude oil and gas.[30] GHG Emissions from the E&P segment originate from two main sources: (i) the energy required to extract and pretreat the oil and (ii) flaring and venting and fugitive losses of associative volatile hydrocarbons.[31] The extraction of heavy oils from sources such as the oil sands

28 Forrest, Jackie and Marcus Rocque, "Crude Oil Investing in a Carbon Constrained World: 2017 Update," ARC Energy Research Institute, October 2017, p. 11, https://www.arcenergyinstitute.com/wp-content/uploads/Crude-Oil-Investing-in-a-Carbon-Constrained-World-2017-Update.pdf.

29 Figure 1 is based off of "Strategic Report," BP, 2013, pp. 2-3.

30 "Chapter 41. Oil and Gas Industry," IRS, https://www.irs.gov/irm/part4/irm_04-041-001.

31 Edwards, Robert, Jean-François Larivé, David Rickeard, and Wemer Weindorf, "Well-to-Wheels Analysis of Future Automotive Fuels and Powertrains in the European Context," European Commission, 2014, p. 21.

are particularly GHG Emission-intensive because of the large energy input required to produce and process the fuel.[32]

b. **Midstream:** This segment of the value chain is often defined to include gas plants, liquefied natural gas ("LNG") production and regasification, and oil and gas pipeline transportation systems. The midstream segment accomplishes the transportation of crude oil to crude storage facilities and to crude oil refineries, the further processing of natural gas and natural gas liquids, and the transportation of refined oil products, natural gas, and chemicals to end markets.[33] In addition to GHG Emissions generated from mobile sources, the midstream sector generates GHG Emissions from compressor exhausts, tank vents, natural gas processing, and fugitive emissions.[34]

c. **Refining or Manufacturing:** This segment consists of crude oil refineries. An oil refinery is a complex combination of process plants, the objective of which is to turn crude oil into marketable products, including fuels, lubricants, and petrochemicals, of the right quality and quantity.[35] GHG Emissions from the refining segment include emissions from stationary combustion units located

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32 Edwards, Robert, Jean-François Larivé, David Rickeard, and Wemer Weindorf, "Well-to-Wheels Analysis of Future Automotive Fuels and Powertrains in the European Context," European Commission, 2014, p. 26.

33 Devold, Havard, "Oil and Gas Production Handbook," ABB, pp. 16-18, https://library.e.abb.com/public/34d5b70e18f7d6c8c1257be500438ac3/Oil%20and%20gas%20production%20handbook%20ed3x0_web.pdf.

34 "Oil & Gas – Midstream," Sustainability Accounting Standards Board ("SASB"), June 2014, p. 9, https://www.sasb.org/wp-content/uploads/2014/06/NR0102_ProvisionalStandard_OGMidstream.pdf.

35 Edwards, Robert, Jean-François Larivé, David Rickeard, and Wemer Weindorf, "Well-to-Wheels Analysis of Future Automotive Fuels and Powertrains in the European Context," European Commission, 2014, p. 27; "Strategic Report," BP, 2013, pp. 2-3.

within the refinery and emissions from venting, flares, and fugitive leaks from equipment (e.g., valves, flanges, pumps).[36]

d. **Marketing:** This segment consists of the wholesale and retail distribution of refined petroleum products to end users, including through retail gasoline stations. Together, refining and marketing are commonly known as "downstream."[37]

30. As shown in Figure 2 below, GHG Emissions are produced in each segment of the value chain. Additionally, the final stage in the lifecycle of oil and gas is the consumption of refined oil products and natural gas by end users. While the combustion of fossil fuels generates the majority of GHG Emissions over the entire lifecycle of oil, the GHG Emissions produced during the E&P and Refining of oil are not insignificant in terms of absolute emissions quantity. [38] It is important to note that the total GHG Emissions over the entire value chain and the relative proportion of GHG Emissions shown from each segment in Figure 2 are based on the U.S. refined average crude in 2014. Each specific crude oil has a different total GHG Emission over its lifecycle and creates different proportions from each segment of the sector.[39] Certain crudes, such as Canadian oil sands, have greater total GHG Emissions than the U.S. refined average crude.[40]

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36 "Greenhouse Gas Reporting Program 2016: Refineries," United States Environmental Protection Agency, https://www.epa.gov/ghgreporting/ghgrp-2016-refineries.

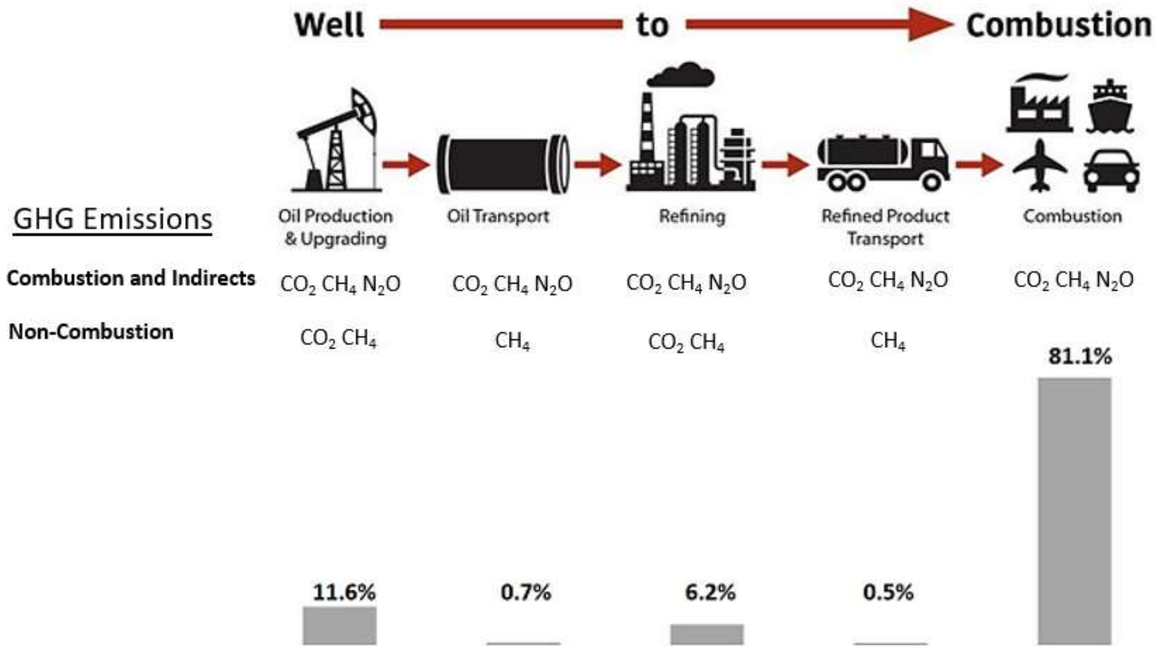
37 "Marketing and Distribution," Library of Congress Business Reference Services Issue 5/6, 2006, http://www.loc.gov/rr/business/BERA/issue5/marketing.html.

38 "Assessing Global Oils," Oil-Climate Index, oci.carnegieendowment.org/.

39 Forrest, Jackie and Marcus Rocque, "Crude Oil Investing in a Carbon Constrained World: 2017 Update," ARC Energy Research Institute, October 2017, p. 10, https://www.arcenergyinstitute.com/wp-content/uploads/Crude-Oil-Investing-in-a-Carbon-Constrained-World-2017-Update.pdf.

40 "Oil Sands, Greenhouse Gases, and US Oil Supply: Getting the Numbers Right," IHS CERA, 2010, p. 8, https://cdn.ihs.com/ihs/cera/Oil-Sands-Greenhouses-Gases-and-US-Oil-Supply.pdf.

Figure 2: Overview of GHG Emissions Across the Oil Industry[41]



31. The oil and gas industry accounts for a significant amount of global GHG Emissions, which have been increasing worldwide. In 2017, total GHG Emissions produced 50.9 billion tons of CO_2 equivalent, double the levels in 1970.[42] Combustion of oil and natural gas accounts for 49 percent of global CO_2 emissions, and oil and natural gas accounts for

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41 Figure 2 is adapted from two sources, and shows the percentage of emissions at each stage of the value chain for crude oil. Emissions shown based on 2014 U.S. refined average. CO_2, CH_4, and N_2O are the chemical symbols for carbon dioxide, methane, and nitrous oxide gasses respectively. Forrest, Jackie and Marcus Rocque, "Crude Oil Investing in a Carbon Constrained World: 2017 Update," ARC Energy Research Institute, October 2017, p. 11, https://www.arcenergyinstitute.com/wp-content/uploads/Crude-Oil-Investing-in-a-Carbon-Constrained-World-2017-Update.pdf;"Estimating Petroleum Industry Value Chain (Scope 3) Greenhouse Gas Emissions," IPIECA, p. 14, https://www.api.org/~/media/Files/EHS/climate-change/Scope-3-emissions-reporting-guidance-2016.pdf.

42 Olivier, Jos G.J. and Jeroen A.H.W. Peters, "Trends in Global CO_2 and Total Greenhouse Gas Emissions 2018 Report," PBL Netherlands Environmental Assessment Agency, December 2018, pp. 11-12, https://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2018-trends-in-global-co2-and-total-greenhouse-gas-emissons-2018-report_3125.pdf.

24 percent of global methane emissions.[43] By industry sector, energy (which includes combustion-related and fugitive emissions from the energy, manufacturing and construction industries) and transportation are two of the largest sources of GHG Emissions, accounting for 53.1 percent (23.09 billion tons) and 12.8 percent (5.55 billion tons) of emissions in 2010, respectively.[44] The IEA projects overall energy-related GHG Emissions to increase 21 percent by 2030 relative to 2014 levels if current climate change policies stay in place.[45]

32. The oil and gas industry is composed of numerous producers around the world. The industry includes a few large companies, including ExxonMobil, that operate globally in both the upstream and downstream segments. Table 1 below shows the top oil and gas producers (either publicly held or state-owned/controlled) based on revenues in 2017.

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43 Olivier, Jos G.J. and Jeroen A.H.W. Peters, "Trends in Global CO_2 and Total Greenhouse Gas Emissions 2018 Report," PBL Netherlands Environmental Assessment Agency, December 2018, p. 9, https://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2018-trends-in-global-co2-and-total-greenhouse-gas-emissons-2018-report_3125.pdf.

44 Energy sector emissions include "public heat and electricity production; other energy industries; fugitive emissions from solid fuels, oil and gas, manufacturing industries and construction." These estimates combine estimated 2010 emissions of carbon dioxide and nitrous oxide with 2008 estimates of emissions of methane. 2010 estimates of emissions of methane were not available. Ritchie, Hannah and Max Roser, "CO_2 and Other Greenhouse Gas Emissions," https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions.

45 "World Energy Outlook 2018," IEA, https://www.iea.org/weo/energyandclimatechange/.

Table 1: Top Oil and Gas Producers by 2017 Revenues[46]

	Company	Country	2017 Revenue ($ Billions)[47]
Publicly-Owned			
1	Royal Dutch Shell ("Shell")	Netherlands	305.2
2	BP plc ("BP")	UK	238.4
3	ExxonMobil	USA	237.2
4	Total S.A. ("Total")	France	149.1
5	Chevron Corporation ("Chevron")	USA	127.5
6	PJSC Lukoil Oil Company ("Lukoil")	Russia	97.8
7	Eni S.p.A ("Eni")	Italy	73.3
State-Owned/Controlled [48]			
1	China Petrochemical Corporation (Sinopec)[49]	China	341.2
2	China National Petroleum Corporation[50]	China	332.9
3	Saudi Arabian Oil Company (Aramco)	Saudi Arabia	252.7
4	PJSC Gazprom	Russia	107.9
5	PJSC Rosneft Oil Company	Russia	92.7
6	China National Offshore Oil Corporation	China	78.3

46 This table includes all companies listed on S&P Capital IQ under the primary industry classifications "Integrated Oil and Gas" and "Oil and Gas Exploration" and with 2017 revenues over $70 billion. Revenues listed are those of the entire company. Companies are classified as state-owned if S&P Capital IQ confirmed at least 50 percent public ownership. Revenue data come from S&P Capital IQ.

47 Revenues are converted from each company's reported currency to USD using average 2017 exchange rates from the IRS, https://www.irs.gov/individuals/international-taxpayers/yearly-average-currency-exchange-rates.

48 National Iranian Oil Company's revenue is not available on S&P Capital IQ and is last estimated at $110 Billion by Oil & Gas iQ. Dutta, Sumit, "Top 10 Oil & Gas Companies: National Iranian Oil Co (NIOC)," Oil & Gas iQ, January 10, 2018, https://www.oilandgasiq.com/strategy-management-and-information/articles/top-10-oil-gas-companies-number-3-national-iranian.

49 China Petrochemical Corporation owned 71.3 percent of China Petroleum and Chemical Corporation (as of December 31, 2017), which had 2017 revenue of $362.6 billion.

50 China National Petroleum Corporation owned 82.7 percent of PetroChina Company (as of December 31, 2017), which had 2017 revenue of $309.8 billion.

7	Petróleo Brasileiro S.A. ("Petrobras")[51]	Brazil	77.8
8	Sinochem Corporation[52]	China	72.7
9	Petróleos Mexicanos ("Pemex")	Mexico	71.0

B. Overview of ExxonMobil

33. In 1999, Exxon Corporation merged with Mobil Oil Corporation, each originally formed as part of the 1911 split-up of Standard Oil Company Inc., to form Exxon Mobil Corporation, which is publicly traded on the New York Stock Exchange under the ticker "XOM." As of December 31, 2018, ExxonMobil had a market capitalization of $289 billion, making it the 12th largest publicly traded company and the largest publicly traded oil and gas company in the world.[53]

34. ExxonMobil reports its operations in three operating segments.[54]

a. **Upstream:** In 2018, earnings from ExxonMobil's upstream segment were approximately $14 billion, representing 60 percent of its global earnings.[55] As of December 31, 2018, the company had an estimated 15.7 billion barrels of liquids and 51.8 trillion cubic feet of proved natural gas reserves, with daily production

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51 Although the Brazilian federal government owned only 28.67 percent of Petrobras's total shares, the company is included as a "State-Owned" producer because the Brazilian government possessed majority voting control of the company. It owned 50.26 percent of the company's common shares, which are Petrobras's only voting shares. Petróleo Brasiliero, Form 20-F for the Fiscal Year 2017, p. 137.

52 Sinochem Corporation's parent company, Sinochem Group, does not have revenue information available for 2017 on S&P Capital IQ.

53 S&P Capital IQ.

54 "2018 Financial & Operating Review," ExxonMobil, p. 27.

55 Global earnings is calculated as the sum of upstream, downstream, and chemical earnings. "2018 Results and Highlights," ExxonMobil, April 2, 2019, https://corporate.Exxonmobil.com/en/Investors/Annual-Report/financial-operating-highlights.

of 2.3 million barrels of liquids and 9.4 billion cubic feet of natural gas.[56] ExxonMobil has a total resource base of 97 billion barrels of oil equivalent and has an active upstream presence in 41 countries on six continents.[57] Approximately 78 percent of ExxonMobil's $26 billion of capital expenditures in 2018 were invested in the upstream segment.[58]

b. **Downstream:** ExxonMobil is one of the world's largest refiners with nearly 5 million barrels per day of distillation capacity across 21 refineries.[59] ExxonMobil also has an extensive network of over 20,800 retail service stations under the Esso, Exxon, and Mobil brands.[60] In 2018, earnings from its downstream segment were approximately $6 billion, representing 26 percent of its global earnings.[61] In 2018, its global petroleum product sales were 5.5 million barrels per day.[62]

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56 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 96-100.

57 ExxonMobil represented that it had a resource base of 97 billion barrels of oil equivalent (boe) as of 2017. "2017 Financial & Operating Review," ExxonMobil, p. 36, https://corporate.exxonmobil.com/-/media/global/files/annual-report/2017-financial-and-operating-review.pdf; "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 26-27.

58 Total upstream capital and exploration expenditures in the upstream segment amounted to $20.19 billion. "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, p. 88.

59 ExxonMobil, Form 10-K for the Fiscal Year 2018, p. 44.

60 ExxonMobil, Form 10-K for the Fiscal Year 2018, p. 25.

61 Global earnings is calculated as the sum of upstream, downstream, and chemical earnings. "2018 Results and Highlights," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/investors/annual-report/results-and-highlights.

62 "2018 Financial & Operating Review," ExxonMobil, pp. 104-107.

c. **Chemicals:** ExxonMobil Chemical is one of the largest chemical manufacturing companies in the world.[63] The Chemicals segment includes ExxonMobil's business operations related to the processing of feedstock from upstream and downstream operations to manufacture a wide range of hydrocarbon-based chemical products. More than 90 percent of ExxonMobil's chemical capacity is integrated with ExxonMobil refineries or natural gas processing plants.[64] In 2018, earnings from ExxonMobil's chemical business segment was approximately $3 billion, representing 14 percent of global earnings.[65]

35. Currently, ExxonMobil's most significant upstream portfolio of assets by resource base and production are in the Americas.[66] The Americas, primarily the United States and Canada, contributed approximately 44 percent of ExxonMobil's overall 2018 daily liquids production and 30 percent of ExxonMobil's overall 2018 daily natural gas production.[67] Oil sands contributed approximately 16 percent of 2018 total liquids

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63 Tullo, Alexander H., "C&EN's Global Top 50 Chemical Companies: Chemical Profits Continue to Rise as the Global Economy Booms," Chemical & Engineering News, July 30, 2018, https://cen.acs.org/business/finance/CENs-Global-Top-50-chemical/96/i31. *See also* "Powering Progress Around the World," ExxonMobil Chemical, https://www.exxonmobilchemical.com/en/exxonmobil-chemical/about-us.

64 "Powering Progress Around the World," ExxonMobil Chemical, https://www.exxonmobilchemical.com/en/exxonmobil-chemical/about-us.

65 Global earnings is calculated as the sum of upstream, downstream, and chemical earnings. "2018 Results and Highlights," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/investors/annual-report/results-and-highlights.

66 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, p. 42.

67 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 98-99.

production.[68] In particular, company-operated Kearl and Cold Lake are ExxonMobil's key Canadian oil sands assets. Kearl production increased almost 16 percent from 2017 to 2018 to an average of 206,000 gross barrels per day and is expected to produce 240,000 gross barrels per day in 2020, and Cold Lake is one of the largest in-situ, heavy-oil projects in the world with 147,000 barrels per day of production.[69] In the U.S., the Permian basin was the most significant contributor to U.S. oil production in 2018, with the Bakken, Alaska, Gulf of Mexico, and California being the other significant contributors.[70] Additionally, ExxonMobil has a significant natural gas E&P business, including positions in key U.S. unconventional basins, following its acquisition of XTO Energy in 2010 for $41 billion.[71]

36. Similarly, the U.S. contains ExxonMobil's most significant proportion of refining capacity, accounting for over 35 percent of ExxonMobil's global refining capacity, while its largest single refinery at 592,000 barrels per day is located in Singapore.[72] ExxonMobil's major downstream projects include the 250,000 barrel per day light-crude expansion of the Beaumont Refinery, which will increase capacity by 68 percent, infrastructure investments connecting crude oil and natural gas production in the Permian

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68 ExxonMobil, Form 10-K for the Fiscal Year 2018, pp. 9, 14.

69 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, p. 44.

70 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, p. 42.

71 Gelsi, Steve, "Exxon Mobil to Buy XTO Energy in $41 Billion Deal," MarketWatch, December 14, 2009, https://www.marketwatch.com/story/exxon-mobil-to-buy-xto-energy-in-41-billion-deal-2009-12-14.

72 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 104-105.

basin to Gulf Coast refineries, and major refinery investments in Antwerp and Rotterdam.[73] From 2014-2018, ExxonMobil spent approximately $138 billion on capital and exploration expenditures, 79 percent of which was allocated to upstream and over 33 percent spent in the U.S.[74]

37. Since 2008, ExxonMobil's global estimated net GHG Emissions (in CO_2 equivalents) has ranged between 122 and 128 million metric tons per year, with the vast majority of the emissions arising from upstream and downstream operations. For instance, in 2017, 48 percent and 35 percent of ExxonMobil's total GHG Emissions were from upstream and downstream operations, respectively.[75] According to the Political Economy Research Institute, ExxonMobil ranks as the 12th largest U.S. company with regard to the quantity of CO_2 equivalent GHG Emissions and the top GHG emitter among oil and gas companies.[76] The majority of ExxonMobil's direct emissions occur in the Americas.[77]

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73 "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 72, 105.

74 The first percentage represents the 2014-2018 sum of "Total Upstream," divided by the 2014-2018 sum of "Total Capital and Exploration Expenditures." The second percentage represents the 2014-2018 sum of "United States" total capital and exploration expenditures divided by the 2014-2018 sum of "Total Worldwide" total capital and exploration expenditures. "2018 Financial & Operating Review," ExxonMobil, April 2, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/annual-report/2018-Financial-and-Operating-Review.pdf, pp. 88-89.

75 "Energy & Carbon Summary," ExxonMobil, February 14, 2019, https://corporate.exxonmobil.com/-/media/Global/Files/energy-and-carbon-summary/Energy-and-carbon-summary.pdf, p. 30

76 "Greenhouse 100 Polluters Index (2018 Report, Based on 2015 Data)," Political Economy Research Institute, https://www.peri.umass.edu/greenhouse-100-polluters-index-2018-report-based-on-2015-data.

77 ExxonMobil's response to the CDP's Climate Change Module, 2017.

C. Overview of Key Climate Change Regulations

38. To combat what is believed to be climate change driven by human activities, governments around the world have introduced commitments and regulations focused on GHG Emissions to address risks posed by climate change. Many policymakers and industry observers expect these regulations to become increasingly stringent in the coming years.[78] Rex Tillerson, ExxonMobil's former Chairman and Chief Executive Officer, has acknowledged that the company shares this opinion, noting that "the outlook anticipates that stringent government policies will increase the cost of CO_2 emissions over time."[79]

39. In 1992, an international treaty was adopted through the UN Framework Convention of Climate Change at the United Nations Conference of the Parties ("Conference") whose objective was to stabilize "[GHG] concentrations in the atmosphere at a level that would prevent dangerous [human activity-generated] interference with the climate system."[80] The 1997 Kyoto Protocol, the third session of the Conference, bound members to curtail

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78 *See, e.g.*, Rigby, Jon "European Oil and Gas 2019 Outlook - More of the Same," UBS, December 17, 2018, p. 11 ("the most likely trajectory for oil demand means we would miss the implied targets consistent with the Paris Accord. [To meet those targets, p]oliticians and policy makers may try to bend [the demand] curve by introducing more consequential measures on the use of oil and gas."). *See also* Leis, Jorge, "Managing the Energy Transition: Three Scenarios for Planning," Bain & Company, March 12, 2019, https://www.bain.com/contentassets/bf6052e8095448bf9574cbfe48fd25bb/bain_brief-managing_the_energy_transition_three_scenarios_for_planning.pdf ("carbon pricing estimates are becoming more aggressive.").

79 ExxonMobil Shareholder Meeting, May 25, 2016, p. 8.

80 "United Nations Framework Convention on Climate Change," United Nations, 1992, p. 9, http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf. "Conference of the Parties (COP)," United Nations, https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop.

human activity-generated GHG Emissions to "not exceed their assigned amounts."[81] More recently, at the 21st session, members adopted the 2015 Paris Agreement (also known as "COP 21"), which aims to keep the global temperature increase below two degrees Celsius above pre-industrial levels by "undertak[ing] rapid reductions [in GHG Emissions]."[82] Currently, 185 countries have ratified the Paris Agreement, and despite the U.S. government's decision to withdraw from the agreement to date 24 U.S. states have joined the U.S. Climate Alliance and are committed to supporting the Paris Agreement.[83]

40. There has been an over 20-fold increase in domestic climate change laws and policies across 164 countries since the 1997 Kyoto Protocol.[84] The World Bank counted 51 regional, national, or sub-national GHG Emission pricing initiatives as of May 2018 that cover approximately 20 percent of global GHG Emissions.[85,86] For example, in January 2014, a law went into effect in Mexico that levied a carbon tax on fossil fuel

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81 "Report of The Conference Of The Parties On Its Third Session, Held At Kyoto, Article 3," United Nations, March 25, 1998, p. 9.

82 "Paris Agreement," United Nations, 2015, Article 4.

83 "Paris Agreement – Status of Ratification," United Nations, https://unfccc.int/process/the-paris-agreement/status-of-ratification; "Governors" United States Climate Alliance, https://www.usclimatealliance.org/governors-1.

84 Nachmany, Michal, Sam Fankhauser, Joana Setzer, and Alina Averchenkova, "Global Trends in Climate Change Legislation and Litigation," 2017, p. 8, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2017/04/Global-trends-in-climate-change-legislation-and-litigation-WEB.pdf.

85 "State and Trends of Carbon Pricing 2018," World Bank, May 2018, p. 8, https://openknowledge.worldbank.org/bitstream/handle/10986/29687/9781464812927.pdf?sequence=5&isAllowed=y.

86 The largest such initiative is the European Union's ("EU") Emissions Trading Scheme, which was introduced in 2005 and involves 31 countries. Several subnational emissions schemes also operate in the U.S. and China, while states like Japan, France, and Mexico have all launched carbon taxes in the past decade. *See, e.g.*, "EU Emissions Trading System (EU ETS)," European Commission, https://ec.europa.eu/clima/policies/ets_en. *See also* "State and Trends of Carbon Pricing 2018," World Bank, pp. 9–10.

production.[87] Moreover, in the EU, as of December 2018, 18 out of 28 member nations incorporated a CO_2 tax on passenger vehicles, including one-time registration taxes and annual road taxes based on CO_2 emissions.[88]

41. One such regional climate change law is the Alberta (Canada) 2003 Climate Change and Emissions Management Act, whose target was "a reduction by December 31, 2020 of specified [GHG] emissions relative to Gross Domestic Product to an amount that is equal to or less than 50% of 1990 levels."[89]

42. Another region that has enacted laws to curb GHG Emissions and manage climate change risk is Catalonia in Spain. In 2016, Catalonia introduced a carbon tax on road vehicles that would take effect in 2018 where owners would pay an annual tax based on the level of greenhouse gas emissions of their vehicles.[90] The region then introduced the "Climate Change Bill" in 2018 to tax business activities and large vessels that produce pollution by taxing businesses approximately $10 per ton of CO_2 emitted, which will rise to approximately $30 per ton in 2025, and large vessels approximately $1,000 per ton of nitrogen oxide emitted. The goal of the Climate Change Bill is to reduce emissions 65

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87 "Mexico: a Market Based Climate Policy Case Study," EDF and IETA, January 2018, p. 3.

88 All EU countries except Bulgaria, Czech Republic, Denmark, Estonia, Hungary, Italy, Lithuania, Poland, Romania, and Slovakia have a tax on passenger vehicles that accounts for carbon dioxide emissions in some capacity. "CO_2 Based Motor Vehicle Taxes in the EU," European Automobile Manufacturers Association, 2018, https://www.acea.be/uploads/publications/CO2_tax_overview_2018.pdf.

89 "Climate Change and Emissions Management Act," Province of Alberta, 2003, p. 6.

90 Szabo, Mike, "Spain's Catalonia Introduces Carbon Tax for Road Vehicles," Carbon Pulse, January 28, 2016, https://carbon-pulse.com/14839/.

percent by 2040 and 100 percent by 2050.[91] In addition, in December 2018 the EU enacted stricter CO_2 emissions regulations that aim to reduce average CO_2 emissions from new passenger cars and light-commercial vehicles by 15 percent in 2025 and by 37.5 percent in 2030 from their 2021 baseline.[92] The regulations will be measured using a new test that more accurately measures vehicle fuel consumption and emissions,[93] demonstrating the importance of both fuel economy and absolute GHG Emissions in controlling climate change and the actions of governments to impact each aspect of GHG Emissions separately.

43. However, many countries are far from reaching their post-2020 emissions reduction targets agreed to in the Paris Agreement.[94] For instance, as of 2017, the EU had cut CO_2 emissions to 22 percent below 1990 levels, but it has targeted a 40 percent reduction by 2030.[95] As a result, climate change regulations and GHG Emissions reduction policies are widely expected to intensify worldwide in the coming decades.[96] China, the world's

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91 "Catalonia Passes Climate Change Law to Reduce Emissions by 100% by 2050," The Climate Group, August 3, 2017, https://www.theclimategroup.org/news/catalonia-passes-climate-change-law-reduce-emissions-100-2050.

92 "CO2 Emission Standards for Passenger Cars and Light-Commercial Vehicles in the European Union," International Council on Clean Transportation, January 2019, p. 1.

93 "Getting Ready for WLTP," European Automobile Manufacturers Association, p. 1.

94 *See, e.g.*, "Warming Projections: Global Update," Climate Action Tracker, December 2018, p. 1. *See also* "Emissions Gap Report 2018," United Nations Environment Programme, November 2018, p. 8, https://www.unenvironment.org/resources/emissions-gap-report-2018 ("At present, G20 countries are collectively not on track to meet their unconditional NDCs for 2030.").

95 "EU and the Paris Climate Agreement: Taking Stock of Progress at Katowice COP," European Commission, October 26, 2018, p. 1.

96 Bain & Company ("Bain") noted in a 2019 report, "carbon regulations have gained traction in both Asia and the Americas; as countries begin to use carbon pricing as a measurement of climate change risk, carbon pricing estimates are becoming more aggressive." Leis, Jorge, "Managing the Energy Transition: Three Scenarios for Planning," Bain & Company, March 12, 2019

biggest carbon emitter today, approved a national emissions trading scheme in 2017, while a coalition of nine U.S. East Coast states plans to cap transportation emissions.[97] Similarly, in Alberta, Canada, a provincial carbon tax of $20 per ton of CO_2 went into effect in January 2017 and rose to $30 in 2018.[98] This regulation, was meant to "add rigour" and incentivize "decarbonization of Alberta's industry at an accelerated rate" relative to the previous regulation.[99] Additionally, in the decade up to 2017, the number of governments with vehicle fuel economy standards increased from four to ten.[100] In addition to an expected increase in the number of governments adopting such fuel economy standards, fuel economy standards themselves are expected to get stricter in the future.[101] While the purpose of these increased fuel economy standards is to reduce the

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https://www.bain.com/contentassets/bf6052e8095448bf9574cbfe48fd25bb/bain_brief-managing_the_energy_transition_three_scenarios_for_planning.pdf.

97 Xu, Muyu and Josephine Mason, "China Aims for Emission Trading Scheme in Big Step vs. Global Warming," Reuters, December 19, 2017, https://www.reuters.com/article/us-china-carbon/china-aims-for-emission-trading-scheme-in-big-step-vs-global-warming-idUSKBN1ED0R6; Transportation & Climate Initiative, "Transportation & Climate Initiative Statement," December 18, 2018, https://www.georgetownclimate.org/files/Final_TCI-statement_20181218_formatted.pdf.

98 "Working to Make Life Better: Fiscal Plan," Province of Alberta, March 16, 2017, p. 99, https://open.alberta.ca/dataset/aa40ded0-75b3-48fe-9bbf-ea33802b8825/resource/da23ee3c-b79c-4971-8f75-e28ab7684983/download/fiscal-plan-complete.pdf.

99 Saric, Dana, Lorne Carson, and Courtney Bohn, "Carbon Competitiveness Incentive Regulation Replaces and Adds Rigour to Alberta's Existing Industrial Carbon Emissions Regulation," Osler, December 22, 2017, https://www.osler.com/en/resources/regulations/2017/carbon-competitiveness-incentive-regulation-replac.

100 Yang, Zifei and Anup Bandivadekar, "2017 Global Update: Light-Duty Vehicle Greenhouse Gas and Fuel Economy Standards," The International Council on Clean Transportation, June 23, 2017, https://www.theicct.org/publications/2017-global-update-LDV-GHG-FE-standards.

101 *See, e.g.*, "ASEAN Countries Adopt Fuel Economy Roadmap," Global Fuel Economy Initiative, November 20, 2018, https://www.globalfueleconomy.org/blog/2018/november/asean-countries-adopt-fuel-economy-roadmap. *See also* "Fuel Economy Improvements are Projected to Reduce Future Gasoline Use," EIA, May 23, 2017, https://www.eia.gov/todayinenergy/detail.php?id=31332.

consumption of refined products and therefore curb crude oil consumption, the standards indirectly impact the overall quantity of GHG Emissions as well.[102]

44. Meanwhile, reflecting a more stringent regulatory environment, a growing number of businesses are also responding by incorporating GHG Emission costs into their long-range planning. A May 2018 World Bank report noted over 1,300 companies worldwide that were using or planned to use internal GHG Emission costs in their decision-making, including more than 100 Fortune 500 Global Companies.[103] These also include major oil and gas companies that have publicly disclosed that they use a proxy cost for GHG Emissions in their planning and investment decisions. I discuss these proxy cost for GHG Emissions disclosures by oil and gas companies in further detail in Section IV.B.3 below.

IV. CLIMATE CHANGE REGULATORY RISK IS A RELEVANT FACTOR IN THE ASSESSMENT OF OIL AND GAS COMPANIES GENERALLY

A. Overview of Factors Considered by the Investment Community in Evaluating Oil and Gas Companies

45. The Investment Community's evaluation of oil and gas companies takes into account a broad range of factors. These include not only company-specific metrics but also industry trends, regulatory risk, and other external risk factors that may influence the performance of companies in the oil and gas sector, including ExxonMobil.

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102 *See, e.g.*, "Corporate Average Fuel Economy (CAFE) Standards," U.S. Department of Transportation, https://www.transportation.gov/mission/sustainability/corporate-average-fuel-economy-cafe-standards. *See also* "Corporate Average Fuel Economy (CAFE) Standards," Alliance to Save Energy, July 27, 2018, https://www.ase.org/resources/corporate-average-fuel-economy-cafe-standards.

103 "State and Trends of Carbon Pricing 2018," World Bank, May 2018, p. 55 https://openknowledge.worldbank.org/bitstream/handle/10986/29687/9781464812927.pdf?sequence=5&isAllowed=y.

46. For example, equity research analysts covering oil and gas companies typically develop stock price targets. In developing these targets, the analysts consider quantifiable metrics such as the current price of oil and gas products, oil and gas proved reserves, current and projected capital expenditures, existing production capacity, operational costs, production growth, operating margins, total oil and gas resource base, and the generation of Earnings Before Interest, Taxes, Depreciation, and Amortization ("EBITDA") and free cash flows.[104] To gain a complete picture of the business, however, analysts also typically consider additional risk factors in their evaluation that could impact the future operations and profitability of oil and gas companies. Such factors may include, among others, external supply and demand factors that could influence the market price of oil and gas products, quality of a company's management, restrictions imposed by the U.S. or other jurisdictions on doing business, risk that the company may not be able to find and develop new reserves economically, inaccuracies in reserves or resource base estimates or assumptions underlying those estimates, and regulatory risks that could affect the company's business.[105]

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[104] *See, e.g*, Rigby, Jon *et al.,* "European Oil and Gas: 2019 Outlook: More of the Same," UBS, December 17, 2018, pp. 10-11, 72-73, 81. *See also* Darby, Sean, Kenneth Chan, and Dodo Cheng, "Global Equity Strategy: US Outlook: The Return of US Competitiveness," Jefferies, January 9, 2012, pp. 106-107; Margolin, Sam, Jason Gabelman, and Brian Zhang, "Exxon Mobil Corporation: Notes from the Road," Cowen, June 25, 2018, p. 9.

[105] *See, e.g.*, ExxonMobil, Form 10-K for the Fiscal Year 2017, pp. 2-4; Rigby, Jon et. al., "European Oil and Gas: 2019 Outlook: More of the Same," UBS, December 17, 2018, pp. 10-11, 81. *See also* Lai, Elaine and Laban Yu, "Integrated Oil Cash Dry, But There's No Stopping the Supermajor; Initiate Sinopec Group Cost," Jefferies, February 16, 2016; QEP Resources, Inc., Form 10-K for the Fiscal Year 2018, p. 35; Anadarko Petroleum Corporation, Form 10-K for the Fiscal Year 2018, p. 41; Sankey, Paul, David T. Clark, and Silvio Micheloto, "XOM-XTO Hearing; Oil Industry Keeps Rising in DC," Deutsche Bank, January 21, 2010, p. 1.

47. Moreover, the oil and gas industry faces unique risks due to the long time horizon of many of its assets. Oil and gas reserves are produced over a multi-year time frame, with many reserves, such as ExxonMobil's oil sands Kearl project in Canada, producing for upwards of 40 years.[106] Due to the long-term nature of the resource extraction, every project initiated and each well drilled will face significant risk due to the uncertainty of future pricing, potential cost escalation, or potential technical or operational challenges that could result in the resource not being produced. Also, oil and gas companies face the risk of a constantly depleting asset base, which presents risks as to the long-term viability of a company. For instance, as stated above, a common future risk present in all oil and gas companies is the ability to replace hydrocarbon reserves that have been produced. If an oil company is unable to replace its depleted reserves, that failure will exert a direct impact on the future financial performance of the company as it will have no oil or gas to sell in order to generate revenues. Similarly, long-term assets are also more vulnerable to potential future regulatory changes that may impose additional costs on oil and gas companies, which can make the production of their hydrocarbon reserves prohibitively expensive.[107] As a result, the Investment Community's assessment of oil and gas companies typically not only takes into account current risk factors but also long-term risk factors that may impact the business.

[106] *See, e.g.*, "Kearl," Imperial, https://www.imperialoil.ca/en-ca/company/operations/oil-sands/kearl. *See also* "ExxonMobil Announces Kearl Expansion Project Starts Production Ahead of Schedule," ExxonMobil, June 16, 2015, https://news.exxonmobil.com/press-release/exxonmobil-announces-kearl-expansion-project-starts-production-ahead-schedule.

[107] *See infra* section V.A.

B. Climate Change Regulatory Risk is a Consideration for the Investment Community in Its Assessment of Oil and Gas Companies

1. The Investment Community Recognizes that the Oil and Gas Industry Faces Significant Climate Change Regulatory Risk

48. Climate Change Regulatory Risk is one long-term risk factor that the Investment Community considers in its evaluation of oil and gas companies. As discussed in Section III.C, many governments around the world have enacted climate change regulations, and such regulations are projected to become increasingly stringent in the future. The oil and gas industry, as a GHG Emission-intensive industry, faces particularly high risk from climate change regulations. These regulations are likely to impose significant costs on the operations of oil and gas companies such as ExxonMobil, thereby impacting their future operating cash flows, profitability growth, and investment returns.[108]

49. The Investment Community has consistently recognized this heightened Climate Change Regulatory Risk faced by the industry and over the years commented on the importance of considering such risk in the assessment of oil and gas companies. For example:

- A 2010 Bain report noted that "oil producers, as a group, are vulnerable to carbon-constraining policies" and "oil firms whose output is dominated by

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[108] Past environmental regulations, such as the Clean Air Act Amendments of 1990, have illustrated the impact that future climate change regulations may exert on the oil and gas industry. Those regulations forced oil refiners to reduce emissions of air pollutants, leading to the closure of nearly a quarter of U.S. refineries between 1990 and 2000. The Clean Air Act also contributed to approximately $128 billion in total compliance costs of U.S. federal environmental regulations between 1990 and 2012.

See "1990 Clean Air Act Amendment Summary: Title I," U.S. Environmental Protection Agency, https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-i. *See also* Rhodes, Anne, "Hostile Operating Climate Augurs Further Closures for U.S. Refiners," *Oil & Gas Journal*, March 10, 1997, https://www.ogj.com/articles/print/volume-95/issue-10/in-this-issue/refining/hostile-operating-climate-augurs-further-closures-for-us-refiners.html; "The Refining Industry in the New Millennium," *World Refining & Fuels Today*, January 1, 2001; "Over-Regulation of the Nation's Refineries," Institute for Energy Research, May 2, 2012, p. 666.

producing at or near the market clearing price prior to CO_2 regulations will find their business severely threatened by such regulations."[109]

- In 2013, Ceres noted that "[t]here is now a widespread view that it is not in the best interest of investors for companies to expend further capital on low return projects. Government policies to reduce GHG emissions would be likely to further reduce the returns of these projects."[110]

- In 2015, the California Public Employees Retirement System ("CalPERS") and California State Teachers Retirement System ("CalSTRS"), both ExxonMobil shareholders at the time, jointly wrote about the risk of climate change regulations, forecasting that it was "likely that some type of carbon emissions legislation will be introduced at the federal level."[111]

- In 2016, BlackRock stated, "we believe all investors should incorporate climate change awareness into their investment processes."[112] Later, in 2017, BlackRock expressed that it believed "that enhanced, meaningful [climate change] disclosures [were] an important step towards building understanding of the impact on individual companies, sectors and investment strategies," and promised to "engage companies most exposed to climate risk to understand their views on" climate-related financial disclosures.[113]

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[109] Leis, Jorge and Kurt Zenz House, "The Green Edge: Why Carbon Competitiveness Matters," Bain & Company, 2010, https://www.bain.com/insights/green-edge-why-carbon-competitiveness-matters/.

[110] EMC 000510874-876, Ceres letter to Rex Tillerson, September 9, 2013, at EMC000510876.

[111] Accordingly, these funds include environmental ("activities that…deplet[e] or reduc[e] air quality") and climate change (an investment's "attention to the impacts of climate change, including attention to relevant climate policy considerations") risks in their list of risk factors that they consider for their investments.

"The Importance of Corporate Engagement on Climate Change," CalPERS and CALSTRS, p 2. S&P Capital IQ; "Investment Policy for Mitigating Environmental, Social, and Governance Risks (ESG)," CALSTRS, 2018, p. A-23, https://www.calstrs.com/sites/main/files/file-attachments/calstrs_esg_policy.pdf.

[112] Prior to this statement, in 2015, BlackRock Investment Institute had stated "we think it is prudent to appreciate the regulatory momentum behind [global warming and its causes]. Governments are moving to curb and eventually reduce greenhouse gas emissions."

"The Price of Climate Change: Global Warming's Impact on Portfolios," BlackRock Investment Institute, October 2015, p. 3, https://www.blackrock.com/corporate/literature/whitepaper/bii-pricing-climate-risk-international.pdf. "Adapting Portfolios to Climate Change: Implications and Sstrategies for All Investors," BlackRock Investment Institute, August, 2016, p. 2, https://www.blackrock.com/corporate/literature/whitepaper/bii-climate-change-2016-us.pdf.

[113] "Our Engagement Priorities for 2017-2018," BlackRock, archived March 22, 2017, https://web.archive.org/web/20170322043929/https://www.blackrock.com/corporate/en-us/about-us/investment-stewardship/engagement-priorities.

- In 2016, BMO Capital Markets commented that "adapting to climate change is putting pressure on the [oil and gas] sector" and that "climate change threatens stranding resources long term."[114]

- In 2017, after the Paris climate change agreement, Deutsche Bank analysts stated that "[a]s disclosure by the companies on emissions improves and with COP21 now ratified, it seems prescient … to think more about the potential implications for the oil and gas sector… For an industry that is a substantial emitter the financial costs have the potential to be very material."[115]

- In 2017, Vanguard, a major ExxonMobil investor, noted that "climate change poses risks to investors in certain sectors, such as oil and gas."[116]

- Similarly, in 2017, New York State Comptroller Thomas P. DiNapoli stated that "[c]limate change is one of the greatest threats to [the New York State Common Retirement Fund ("NYSCRF")]'s long-term value."[117]

- In 2018, UBS stated even more directly: "climate change and the impact of energy transition is a potentially existential issue for the oil and gas world."[118]

50. The Investment Community is particularly concerned that higher costs resulting from climate change regulations could have a significant impact on oil and gas reserves extracted from non-conventional sources such as oil sands, shale, and offshore operations. These sources are typically more GHG Emission-intensive and have lower

[114] Warn, Brendan and Nikolas Stefanou, "ExxonMobil: Gold Standard: Initiating with Market Perform Rating, $78 Target Price," BMO, December 1, 2016, p. 11.

[115] Herrmann, Lucas and Tom Robinson, "European Integrated Oil: 2017 Outlook: Hitting a Sweet Spot," Deutsche Bank, December 6, 2016, p. 46. "COP21" refers to the 2015 Paris Climate Conference where the Paris Agreement was adopted. *See, e.g.,* "Find out More about COP21," Sustainable Innovation Forum 2015, http://www.cop21paris.org/about/cop21. *See also* discussion *infra* Section III.C.

[116] S&P Capital IQ. "Standards Board," Sustainability Accounting Standards Board, https://www.sasb.org/governance/standards-board/; VGI1920, Internal Vanguard memorandum, May 23, 2017, p. 3.

[117] "NYS Comptroller DiNapoli: ExxonMobil Agrees to Assess Impacts of Climate Change," Office of the New York State Comptroller, December 12, 2017, https://www.osc.state.ny.us/press/releases/dec17/121217.htm.

[118] Rigby, Jon, Henri Patricot, and John Delos Santos, "ExxonMobil Corp.: Zigging Not Zagging," UBS, September 7, 2018, p. 37.

margins.[119,120] Therefore, any additional costs related to GHG Emissions could cause such projects to be economically unviable and the assets to be "stranded."[121] The stranded asset risk has been highlighted by both industry analysts and some of ExxonMobil's major investors.[122] For example:

- A 2014 Société Générale report explains, "the high cost of supply of some new oil sands projects makes them marginal and returns are very vulnerable to cost escalation and oil price," and that "[a]pplying the stranded asset lens to these companies' high cost and high carbon projects does raise serious questions about the viability of the long-term business strategies of many fossil energy companies."[123]

- In 2014, Norges Bank, which manages The Government Pension Fund of Norway, is the world's largest sovereign wealth fund today, and owned ExxonMobil's stock at the time,[124] stated that "[t]he production of oil from oil

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119 *See, e.g.*, Gordon, Deborah, "Understanding Unconventional Oil," The Carnegie Papers, May 2012, pp. 1-2, https://carnegieendowment.org/files/unconventional_oil.pdf ("unconventional oils will likely deliver a higher volume of heavier hydrocarbons, require more intensive processing and additives, and yield more byproducts that contain large amounts of carbon."). *See also* Brammer, Marc and Yulia Reuter, "The Viability of Non-Conventional Oil Development," Innovest Strategic Value Advisors, March 2009, p. 2 ("Non-conventional oil (NCO) development, however, is only profitable within a very thin margin space.")

120 The Carbon Asset Risk letter, which was signed in 2013 by over 75 investors representing $3 trillion in assets under management, conveys concern about these high-emissions assets. Specifically, the letter intends "[t]o prevent shareholder capital from being wasted on developing high-carbon and high-cost fossil fuel reserves that are 'unburnable' if the world is to avoid catastrophic climate change or may prove uneconomic if prices decline." "Carbon Asset Risk: A Review of Progress and Opportunities," Ceres, p. 5; "Carbon Asset Risk: A Review of Progress and Opportunities," Ceres, https://www.ceres.org/resources/reports/carbon-asset-risk-review-progress-and-opportunities.

121 Stranded assets are assets "that lose value or turn into liabilities before the end of their expected economic life. In the context of fossil fuels, this means those that will not be burned - they remain stranded in the ground." Paun, Ashim, Zoe Knight, and Wai-Shin Chan, "Stranded Assets: What Next?," HSBC, April 16, 2015, pp. 1, 23.

122 As I noted in Section III.B, oil sands projects are some of the most significant ExxonMobil assets.

123 Whooley, Niamh *et al.,* "US Tight Oil (Shale) vs Canadian Oil Sands - Stranded Asset Risk - Cost of Supply, GHG Emissions, Water," Société Générale, September 2014, pp. 5, 7.

124 Meredith, Sam, "World's Largest Sovereign Wealth Fund to Scrap Oil and Gas Stocks," CNBC, March 8, 2019, https://www.cnbc.com/2019/03/08/norway-worlds-largest-sovereign-wealth-fund-to-scrap-energy-stocks.html. S&P Capital IQ.

sands may be exposed to risk in the event of climate-related regulatory changes."[125]

- In 2016, BlackRock, a major ExxonMobil investor, also stated that stranded asset risk might arise if "[g]overnments […] 'tax' fossil fuels to an extent that it is no longer feasible to develop them."[126]

- In 2017, State Street, another major ExxonMobil investor, came to a similar conclusion, stating that consideration of climate risk in long-term strategy is "particularly important for companies in the oil and gas [and other extraction-based] sectors where long investment horizons could render assets stranded." Because of that risk, "carbon price assumptions are important because [they…] provide insight into how companies account for climate risk in the planning process[, and …] are key in helping companies identify potential stranded assets and mitigating the risk of investing in assets that may become stranded in the future."[127]

2. *Environmental, Social, and Governance ("ESG") Concerns Have Caused Some Investors to Divest Holdings in Fossil Fuel Investments*

51. Some investors are motivated not only by investment returns but also by greater concern for the sustainability and ethical impact of their investment decisions.[128] As the ESG

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[125] "Responsible Investment: Government Pension Fund Global," Norges Bank Investment Management, 2014, p. 71, https://www.nbim.no/globalassets/reports/2014/2014-responsible-investment.pdf.

[126] "Adapting Portfolios to Climate Change: Implications and Strategies for All Investors," BlackRock Investment Institute, September 2016, p. 6, https://www.blackrock.com/corporate/literature/whitepaper/bii-climate-change-2016-us.pdf.

[127] "SSGA's Perspective on Effective Climate Change Disclosure," State Street Global Advisors, August 7, 2017, pp. 1-2, https://www.ssga.com/investment-topics/environmental-social-governance/2017/perspectives-on-effective-climate-change-disclosure.pdf.

[128] For example, in 2013, State Street stated "[p]rotecting and preserving our natural resources helps us to increase efficiency, attract and retain clients, save money, and engage employees." "The Way Ahead: Corporate Responsibility 2013 Report," State Street, 2013, p. 3, http://www.statestreet.com/content/dam/statestreet/documents/values/2013_CR_Report.pdf.

In 2015, Morgan Stanley declared "[w]e believe that understanding E, S and G risks and opportunities can only enhance investment decisions. As such, this added layer of analysis should be relevant and interesting for all investors, whether or not they have an SRI [Socially Responsible Investing] mandate." Alsford, Jessica *et al.*, "Embedding Sustainability into Valuation," Morgan Stanley, January 27, 2015, p. 4.

Similarly, in 2016, BlackRock noted "[p]olicy makers, asset owners, and the public at large are focused on ESG factors as a means to promote sustainable business practices and products. Investment professionals increasingly see its potential links to company operational strength, efficiency, and management of long-term

approach generally espoused by these investors becomes more prevalent and accepted in the Investment Community, the oil and gas industry may face further risk stemming from investors' aversion to investing in GHG Emission-intensive businesses and industries.[129]

52. Such ESG concerns, along with investors' considerations about Climate Change Regulatory Risk, have caused major institutional investors to consider reducing the exposure of their investment portfolios to companies that depend on fossil fuels. For instance, according to a report on the divestment movement, as of September 2018, "nearly 1,000 institutional investors with $6.24 trillion in assets have committed to divest from fossil fuels, up from $52 billion four years ago."[130]

53. Several institutional investors, which include some of ExxonMobil's investors, have reduced their exposure to GHG Emission-intensive investments or have considered doing so. In fact, in 2014 UN secretary general Ban Ki-moon stated: "I have been urging

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financial risks." "Exploring ESG: A Practitioner's Perspective," BlackRock, June 2016, p. 1, https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-exploring-esg-a-practitioners-perspective-june-2016.pdf.

[129] In 2018, Oliver Wyman's Global Head of Energy opined that "climate change considerations, other environmental issues and litigatory concerns are increasingly shaping investment fund decisions, with $6 trillion of funds (led by the insurance sector with $3 trillion) committed to divestment from fossil fuel equity classes. Major energy companies have cited this divestment as a material risk to their business and are doing significant development in renewables." Austin, Francois, "Is The Energy Industry Meeting Its Sustainability Goals?," Oliver Wyman, November 5, 2018, https://www.oliverwyman.com/our-expertise/insights/2018/nov/is-the-energy-industry-meeting-its-sustainability-goals.html.

[130] "The Global Fossil Fuel Divestment and Clean Energy Investment Movement: 2018 Report," Arabella Advisors, September 5, 2018, p. 1, https://www.arabellaadvisors.com/wp-content/uploads/2018/09/Global-Divestment-Report-2018.pdf.

companies like pension funds or insurance companies to reduce their investments in a fossil-fuel based economy."[131]

54. Major universities are one such category of institutional investors that have considered divesting from oil and gas companies in their endowment funds. For example:

- In 2012, Unity College became the first institution of higher learning to divest its endowment from investments in fossil fuels.[132]
- In 2015, the University of California ("UC") system, an ExxonMobil investor, sold off its endowment and pension fund holdings in coal and oil sands companies "in response to both environmental concerns and rising financial risk in those industries."[133] Moreover, in 2018, the UC's Chief Investment Officer announced a broader directive to reduce holdings in fossil fuels, including oil and gas companies, stating "fossil fuels…is a financial risk we do not want to take in the context of real assets. We will fundamentally reduce those holdings."[134]
- In 2016, the Dartmouth College Advisory Committee on Investor Responsibility, which makes investment recommendations to Dartmouth College, another ExxonMobil investor, noted that "[t]he future of fossil fuels is undeniably limited and early divestment positions Dartmouth as a leader and might avoid losses down the road."[135]

131 "UN Secretary General Advises Pension Funds to Divest from Fossil Fuels," Pension Funds Online, November 6, 2014, http://www.pensionfundsonline.co.uk/content/pension-funds-insider/investment/un-secretary-general-advises-pension-funds-to-divest-from-fossil-fuels/1559.

132 "Divestment," Unity College, https://www.unity.edu/about/sustainability-science/fossil-fuel-divestment/.

133 S&P Capital IQ; Gordon, Larry, "UC Sells Off $200 Million in Coal and Oil Sands Investments," Los Angeles Times, September 9, 2015.

134 Jacobius, Arleen, "Fossil Fuels to be History for UC Investment Office," Pensions & Investments, April 2, 2018, https://www.pionline.com/article/20180402/PRINT/180409989/fossil-fuels-to-be-history-for-uc-investment-office.

135 "Catalog of Reasons for and Against Fossil Fuel Divestment by Dartmouth," Dartmouth College Advisory Committee on Investor Responsibility https://www.dartmouth.edu/~president/announcements/carbon_pro_and_con.pdf. "Executive Summary Prepared for the Dartmouth Community Fiscal 2017," Dartmouth College Advisory Committee on Investor Responsibility, p. 14. *See also* "Mission," Dartmouth College Advisory Committee on Investor Responsibility, https://www.dartmouth.edu/~finance/committees/acir.html.

- In 2019, Middlebury College announced that it "will begin a phase-out of direct fossil fuel investments in the endowment [that will] eliminate such investments entirely."[136]

55. Similarly, recent legislation has also put pressure on public pension funds, yet another category of institutional investors to divest from GHG Emission-intensive assets. Selected examples include:

- In 2017, "CalPERS completed divesting stock in 14 thermal coal companies," in response to a California law that required CalPERS and CALSTRS to divest from investments in coal by July 2017.[137]
- In 2018, Ireland passed a bill that required its national investment fund to sell all investments in coal, oil, gas, and peat.[138]
- On January 22, 2019, the New York State Senate put forward a bill for the 2019-2020 legislative session, that would "prohibit the State Comptroller from investing monies of the Common Retirement Fund … in the Carbon Underground 200, an aggregated list of the top 100 coal and top 100 oil/gas (fossil fuel) publicly traded companies, as defined by the carbon content in the companies' proven reserves." The list of companies includes ExxonMobil.[139]

56. Major asset managers have also framed divestment from fossil fuels and GHG Emission-intensive companies as a way to accommodate investor demand. For example:

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[136] "Middlebury Announces Energy2028 Plan to Address Threat of Climate Change," January 29, 2019, http://www.middlebury.edu/newsroom/archive/2019-news/node/611978.

[137] Diamond, Randy, "CalPERS Reveals it Divested from Most Thermal Coal Companies," Pensions & Investments, August 7, 2017, https://www.pionline.com/article/20170807/ONLINE/170809876/calpers-reveals-it-divested-from-most-thermal-coal-companies.

[138] Carrington, Damian, "Ireland Becomes World's First Country to Divest from Fossil Fuels," The Guardian, July 12, 2018, https://www.theguardian.com/environment/2018/jul/12/ireland-becomes-worlds-first-country-to-divest-from-fossil-fuels.

[139] New York State Senate, "Senate Bill S2126," https://www.nysenate.gov/legislation/bills/2019/s2126. "DivestInvest – the Carbon Underground 200," Fossil Free Indexes, http://fossilfreeindexes.com/divestinvest/.

- In 2016, BlackRock explained that "[m]any asset owners address climate change by adjusting existing portfolios [including] some exclusion of resources or utility companies."[140]

- In 2016, State Street began offering two fossil-fuel-reserves-free ETFs [Exchange Traded Funds], which the company had "[d]eveloped to address growing client demand for ESG strategies and help investors divest from companies owning fossil fuel reserves."[141]

- In late 2017, the large France-based insurer AXA announced that it initiated "the divestment of over Euro 700 million from the main oil sands producers and associated pipelines, and the discontinuation of further investments in these businesses" because "oil sands are … an extremely carbon-intensive form of energy and a serious cause of environmental pollution."[142]

3. Oil and Gas Companies and Their Shareholders Have Considered and Taken Measures to Manage Climate Change Regulatory Risk

57. Given the concerns of the Investment Community regarding Climate Change Regulatory Risk and demands for additional information on managing this risk, it is not surprising that oil and gas companies have also made frequent disclosures regarding the risks posed to their business by climate change regulations. For instance, a 2017 analysis of the annual SEC filings of the 100 largest publicly traded U.S. oil and gas companies found

[140] "Adapting Portfolios to Climate Change: Implications and Strategies for All Investors," BlackRock Investment Institute, August 2016, p. 9, https://www.blackrock.com/corporate/literature/whitepaper/bii-climate-change-2016-us.pdf.

[141] "State Street Global Advisors Expands Suite of Environmental, Social and Governance (ESG) ETFs," State Street, October 25, 2016, https://newsroom.statestreet.com/press-release/corporate/state-street-global-advisors-expands-suite-environmental-social-and-governan.

[142] "AXA Accelerates its Commitment to Fight Climate Change," AXA, December 12, 2017, https://group.axa.com/en/newsroom/press-releases/axa-accelerates-its-commitment-to-fight-climate-change.

that more than 90 percent of those companies cited "[i]mpact of climate change/greenhouse gas legislation" as a risk factor to their business.[143]

58. Additionally, Exhibit 1 shows the scores assigned by Carbon Disclosure Project ("CDP") to ExxonMobil and its peer companies in the oil and gas industry based on the comprehensiveness of disclosures related to climate change, awareness, and leadership on environmental issues.[144] As can be seen from the exhibit, CDP has rated ExxonMobil and its peers including Chevron, BP, ENI, Royal Dutch Shell, and Total, some of the largest publicly-traded oil and gas companies, since as early as 2010 based on their disclosures on climate change related issues.[145] These companies, furthermore, have generally complied with CDP's requests for detailed climate change disclosures. Moreover, industry analysts have encouraged such disclosures on climate change related issues, especially companies' use of proxy cost for GHG Emissions to account for Climate Change Regulatory Risk.[146] As Exhibit 2 demonstrates, CDP has requested information from ExxonMobil and many of its peers regarding their accounting of GHG Emission costs. The exhibit shows that these companies have usually responded by acknowledging

[143] "2017 BDO Oil and Gas Risk Factor Report," BDO, p. 1, https://www.bdo.com/getattachment/a1bf67be-1beb-42b1-8f0c-f3db2446c6ed/attachment.aspx?2017-Oil-Gas-Riskfactor-Report-Brochure_WEB.pdf.

[144] CDP is a charity which runs a disclosure system that allows companies "to measure and manage their environmental impacts." "Our Vision and Mission," CDP, https://www.cdp.net/en/info/about-us.

[145] I discuss the specific climate change related disclosure made by ExxonMobil during the relevant period in further detail in Section V.B.

[146] *See, e.g.*, "A Framework for 2 Degrees Scenario Analysis: A Guide for Oil and Gas Companies and Investors for Navigating the Energy Transition," Ceres, 2016, p. 32, https://www.ceres.org/sites/default/files/reports/2017-03/Framework_Jan%2010%2017.pdf ("[t]o evaluate how well a company is positioned to change course as carbon externalities get re-priced…investors may want to consider questions such as…[d]oes the company use a carbon price in deliberations on capital projects.").

that they account for GHG Emission costs through the use of proxy costs in their business planning.[147] In turn, equity research analysts have taken note of these proxy cost disclosures related to GHG Emissions by the companies in their assessments.[148]

59. However, despite oil and gas companies' disclosures on Climate Change Regulatory Risk, their shareholders have still demanded more information about the companies' actions to account for and manage climate change related risks. Exhibit 3 provides a summary of the number of shareholder proposals related to climate change risks that were put up for a vote from 2007-2018 by shareholders for BP, Chevron, and Shell as well as ExxonMobil. Oil and gas company shareholders have voted on climate change related proposals every year since 2007, and the number of proposals has increased over time. Shareholder proposals are not limited to these oil "majors" as climate change proposals have also been submitted at oil and gas companies such as Anadarko Petroleum

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147 Chevron represents that it "recognizes that climate change is a growing area of interest for our investors and stakeholders […] and we are responding" to those concerns. "Climate Change Resilience: A Framework for Decision Making," Chevron, March 2018, p. 1, https://www.chevron.com/-/media/shared-media/documents/climate-change-resilience.pdf. Similarly, Shell's Vice President of CO_2 has described the practice of including a proxy cost for GHG Emission in investment appraisal as something that "improves the investment's robustness to future CO2 regulation." Gillespie, Angus, "Case Study: Shell's CO2 Project Screening Value," in *GHG Market Report*, International Emissions Trading Association, 2015, p. 36, https://www.ieta.org/resources/Resources/GHG_Report/2015/IETA_GHG_Report_2015_web.pdf.

148 In fact, 11 of the 16 investment banks whose reports I analyze in Section V.C.3 include discussion of oil and gas companies' use of a proxy cost for GHG Emissions in at least one research report. For example, in 2015, HSBC compared proxy costs for GHG Emissions for a number of oil and gas companies, including ExxonMobil ("may approach USD80/tonne"), BP ("USD40/tCO_{2e}"), Shell ("USD40/tonne"), and Total ("EUR25/tonne"). Knight, Zoe, Wai-Shin Chan, and Ashim Paun, "Keeping it Cool: Moving Towards Global Carbon Pricing," HSBC, September 2015, p. 11. Similarly, in 2018, UBS, noted carbon prices for a number of oil and gas companies, including Eni ("$40/t at 2015 inflated"), Galp ("$40/ton"), and Total ("$30-40/t") as examples of oil companies increasingly "highlighting efforts to target reducing their own GHG emissions." UBS further noted that several other companies, including Chevron, incorporate a proxy cost for GHG Emissions. Rigby, Jon *et al.,* "European Oil and Gas: 2019 Outlook: More of the Same," UBS, December 17, 2018, pp. 73-75.

Corporation, Chesapeake Energy Corporation, ConocoPhillips, Devon Energy Corporation, Kinder Morgan, Inc., Noble Energy, Inc., and Occidental Petroleum Corporation ("Occidental"), demonstrating that the concerns of these risks are truly sector-wide.[149]

60. A selected listing of these climate change related shareholder proposals in the oil and gas industry is provided in Exhibits 4.A-C. Some of the notable proposals include:

- In 2015, a coalition of investors submitted identical resolutions to both BP and Shell asking that the companies strengthen their climate change disclosures. The resolutions, titled "Strategic Resilience for 2035 and Beyond," included specific requests for reporting on items such as "asset portfolio resilience" and "public policy positions relating to climate change."[150] Ultimately, both Shell and BP supported the resolution, which passed at both companies with more than 98 percent of shares voting for the shareholder proposals.[151]

- In 2016, Chevron shareholders proposed a resolution that the company publish an annual assessment of the long-term impacts of plausible climate change scenarios on Chevron's reserve and resource portfolio. While this proposal did not receive majority support, Institutional Shareholder Services ("ISS"), a well-known proxy solicitor firm, supported the measure and it received 41 percent of the shareholder vote.[152] In 2017, the proponents withdrew this proposal after Chevron issued a climate change report that one of the proponents viewed as "a 'first step' toward explaining to investors how the company assesses climate change scenarios [in] its strategic planning efforts."[153]

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149 Anadarko Petroleum Corporation, Form DEF 14A, 2018, p. 74; Chesapeake Energy Corporation, Form DEF 14A, 2018, p. 81; ConocoPhillips, Form DEF 14A, 2017, p. 85; Devon Energy Corporation, Form DEF 14A, 2014, pp. 75-76; Kinder Morgan, Inc., Form DEF 14A, 2018, pp. 59-60; Noble Energy, Inc., Form DEF 14A, 2018, p. 24; Occidental, Form DEF 14A, 2017, p. 58.

150 "Notice of BP Annual General Meeting," BP, 2015, p. 4. "Notice of Annual General Meeting," Shell, 2015, p. 5.

151 ISS Voting Analytics data for 2015. "Notice of BP Annual General Meeting," BP, 2015, pp. 4, 29; "Notice of Annual General Meeting," Shell, 2015, p. 5.

152 Chevron, Form DEF 14A, 2016, p. 70; ISS Voting Analytics data for 2016.

153 "Update: Wespath and Hermes Withdraw Chevron 'Stress-Test' Proposal," Wespath, May 2, 2017, https://www.wespath.org/news/update-wespath-and-hermes-withdraw-chevron-stress-test-proposal/.

- In another example from 2017, shareholders of Occidental proposed a resolution asking the company to publish a climate change impact assessment that explains topics such as "how capital planning and business strategies incorporate analyses of the short- and long-term financial risks of a lower carbon economy."[154] Occidental's three largest shareholders— Vanguard, BlackRock, and State Street— supported the motion despite the company's Board of Directors' recommendation that shareholders oppose it, and the resolution passed with 67 percent favorable votes.[155]

61. These company disclosures and shareholder proposals, as well as the widespread acknowledgment of Climate Change Regulatory Risk among the Investment Community, demonstrate that climate change regulation represents a salient risk factor in the assessment of oil and gas companies.

V. CLIMATE CHANGE REGULATORY RISK IS A FACTOR IN THE INVESTMENT COMMUNITY'S ASSESSMENT OF EXXONMOBIL

A. ExxonMobil Faces Significant Climate Change Regulatory Risk

62. ExxonMobil is no exception to the significant Climate Change Regulatory Risk facing oil and gas companies. In fact, ExxonMobil has itself consistently identified climate change regulations as a risk to the business.[156]

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154 Occidental, DEF 14A, 2017, p. 58.

155 Keitz, Anders, "Occidental to Produce Climate Risk Report in 2018," The Street, December 15, 2017, https://www.thestreet.com/story/14421477/1/occidental-to-produce-climate-risk-report-in-2018.html. Orol, Ronald, "Exxon, Occidental Remain in Index Fund Crosshairs over Climate Change," The Street, August 24, 2017, https://www.thestreet.com/story/14283512/1/state-street-views-statoil-climate-report-as-model-for-u-s-energy-firms.html.

156 ExxonMobil has explained in its financial filings that "regulatory frameworks to reduce greenhouse gas emissions … could make our products more expensive, lengthen project implementations times, and reduce demand for hydrocarbons. … Current and pending greenhouse gas regulations may also increase our compliance costs." ExxonMobil, Form 10-K/A, filed February 28, 2010, p. 4. Similar language appears in additional ExxonMobil annual filings. ExxonMobil, Forms 10-K for the Fiscal Years 2011 (p. 3), 2012 (p. 3), 2013 (p. 3), 2014 (p. 3), 2015 (p. 3) 2016 (p. 3), 2017 (p.3), and 2018 (p. 3).

63. As discussed in the previous section, climate change regulations pose a particular concern for a company like ExxonMobil whose success depends on investments in capital intensive long-term carbon-based assets.[157] Additionally, ExxonMobil's management has publicly stated that it focuses on maximizing shareholder value over the longer term.[158] Many of ExxonMobil's largest shareholders, which include large asset managers such as BlackRock, State Street, and Vanguard, and university endowments and public pension funds, also share this long-term outlook.[159] Given this long-term outlook, and the fact that future climate change regulations are likely to get stricter in the future, Climate Change Regulatory Risk is likely to have a significant impact on investment returns for both the company and its shareholders.

64. Moreover, many of ExxonMobil's current investments are in GHG Emission-intensive projects that extract oil and gas reserves from non-conventional sources. Any additional costs related to GHG Emissions could cause such GHG Emission-intensive projects with

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157 ExxonMobil, Form 10-K for the Fiscal Year 2018, p. 4 ("The long-term success of ExxonMobil's Upstream, Downstream, and Chemical businesses depends on complex, long-term, capital intensive projects.").

158 Rex Tillerson, ExxonMobil's former Chairman and CEO, has acknowledged that ExxonMobil's businesses operate based on long-term considerations, arguing that the company does not "get overly exercised about what's going on in any given quarter or any given year," but instead focuses on maximizing "value for the shareholder over the next 30 years." Mr. Tillerson has also stated, "At ExxonMobil we focus on the long term." "Transcript of Exxon Mobil Analyst Meeting," Thomson Reuters, March 2, 2016, p. 20; Hearing before the House Subcommittee on Energy and Environment of the Committee on Energy and Commerce: The ExxonMobil-XTO Merger: Impact on U.S. Energy Markets, January 20, 2010 (hereafter, "ExxonMobil-XTO Hearing"), p. 25.

159 *See, e.g.*, Edkins, Michelle, "BlackRock Investment Stewardship Engagement Priorities for 2019," January 31, 2019, https://corpgov.law.harvard.edu/2019/01/31/blackrock-investment-stewardship-engagement-priorities-for-2019/. *See also* Letter from State Street President and CEO to the Company's board, January 15, 2019, https://www.ssga.com/investment-topics/environmental-social-governance/2019/01/2019%20Proxy%20Letter-Aligning%20Corporate%20Culture%20with%20Long-Term%20Strategy.pdf; "Vanguard's Voice on Societal Risks," Vanguard, https://about.vanguard.com/investment-stewardship/perspectives-and-commentary/voice-on-societal-risks.html.

low margins to be economically unviable and cause the assets to be stranded.[160] Acknowledging the risk of climate change regulations to its operations, ExxonMobil's Vice President of Environmental Policy and Planning acknowledged in an internal presentation that "high costs on GHG [E]missions" would be a "major concern for our refining and chemical business…but also for our LNG and heavy oil production."[161]

65. ExxonMobil's oil sands assets are particularly at risk from climate change regulations given that "oil sands provide the worst margins in [ExxonMobil's] portfolio" and higher-than-average GHG Emissions.[162] Oil sands projects such as Cold Lake and Kearl produce more GHG Emissions than other conventional sources, in part, because it requires substantial energy to generate the steam for injection into the reservoir, to transport the oil sands, and to separate the oil from the sand.[163] In addition, energy can be required to further upgrade the bitumen into salable synthetic crude oil.[164] Oil sands projects that use the cyclic steam stimulation ("CSS") process, such as Cold Lake, are among the highest-emitting projects, generating approximately double the well-to-retail pump emissions

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[160] For example, I understand that Professor Bartov has concluded based on his analysis that "[h]ad ExxonMobil included GHG Emission Proxy Costs in its cost projections for its 2015 impairment testing of Mobile Bay, it would have concluded that the book value of Mobile Bay was not recoverable based on the project's remaining net undiscounted cash flows, and consequently recognized an after-tax impairment loss of $320 million to $478 million." *See* Bartov Report, ¶16.

[161] EMC 000371210, "Escalating Pressures on Environmental Performance" presentation, September 1, 2011, at EMC 000371226. *See also Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, p. 30.

[162] Warn, Brendan and Nikolas Stefanou, "Gold Standard: Initiating with Market Perform and $78 Target Price," BMO, December 1, 2016, p. 18.

[163] "GHG Emissions," Canadian Association of Petroleum Producers, https://www.canadasoilsands.ca/en/explore-topics/ghg-emissions.

[164] The more energy that is used in the production process, for assets such as oil sands, the more GHG Emissions are produced through the combustion of fuels to make that energy. *See, e.g.*, "Greenhouse Gas Emissions," Syncrude, https://www.syncrude.ca/environment/energy-and-climate-change/greenhouse-gas-emissions/.

than compared to the average U.S. refined crude oil. Even oil sands projects that do not use the CSS process generate significantly more well-to-retail pump emissions than the average U.S. refined crude.[165] A number of ExxonMobil's other oil reserves, like those in Alaska and California, also generate substantial GHG Emissions.[166] Additionally, GHGs are also emitted in ExxonMobil's operations through flaring during oil recovery and methane leakage in natural gas production.[167] Goldman Sachs summarized the influence of oil sands on ExxonMobil's GHG Emissions, stating that "[g]iven the strong exposure to oil sands in Canada (including its stake in Imperial Oil), ExxonMobil could lower its 2017 GHG emissions by 11 [percent] by 2030 by exiting this high-carbon segment."[168]

B. ExxonMobil Has Consistently Acknowledged the Need to Account for Climate Change Regulatory Risk in Public Disclosures

66. Given these significant risks, it is not a surprise that ExxonMobil has consistently made public disclosures acknowledging the need to account for Climate Change Regulatory Risk in assessing its business. Exhibits 5.A-B provide a detailed timeline of

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165 These emissions comparisons are based on 2005 emissions data. *See, e.g.,* "Cold Lake," Imperial Oil, https://www.imperialoil.ca/en-ca/company/operations/oil-sands/cold-lake. *See also* Burkhard. James *et al.,* "Oil Sands, Greenhouse Gases, and European Oil Supply," IHS, September 2010, p. 11.

166 *Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, p. 30.

167 *See, e.g.*, Brown, Katie, "Stanford Researchers Discuss How to Reduce Major Cause of Oil and Gas Production Emissions," Stanford News, August 30, 2018, https://news.stanford.edu/2018/08/30/country-ranking-oil-production-emissions/. *See also* "Mitigating Emissions in Our Operations," ExxonMobil, October 18, 2018, https://corporate.exxonmobil.com/en/Community-engagement/sustainability-report/managing-risks-of-climate-change/mitigating-emissions-in-our-operations#flaring;"Overview of Greenhouse Gases: Methane Emissions," U.S. Environmental Protection Agency, https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

168 Della Vigna, Michele *et al.,* "Re-Imagining Big Oils," Goldman Sachs, October 8, 2018, p. 33.

ExxonMobil's public disclosures related to Climate Change Regulatory Risk, with select examples discussed in further detail below.

67. Since at least 2010, ExxonMobil has warned in its financial filings that climate change regulations "could make our products more expensive, lengthen project implementation times, and reduce demand for hydrocarbons, as well as shifting hydrocarbon demand toward sources with lower GHG Emissions such as natural gas."[169] In response to this potential shift in hydrocarbon demand, increasing its natural gas reserves and resources to make ExxonMobil more adaptable to these future climate change regulations was one of the key strategic directives of the company's acquisition of XTO.[170]

68. To account for those risks, ExxonMobil has also consistently represented that it has applied a GHG Emission Proxy Cost in its business planning since 2007.[171] Furthermore, since at least 2010, ExxonMobil has published a projected GHG Emission Proxy Cost stemming from climate change regulations. These representations culminated in March 31, 2014, with the release of the "Energy and Carbon - Managing the Risks" and "Energy and Climate" reports, which were highly publicized and provided a more fulsome description of ExxonMobil's practices. These disclosures include:

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[169] ExxonMobil, Form 10-K/A, filed February 28, 2010, p. 4; ExxonMobil, Forms 10-K for the Fiscal Years 2011 (p. 3), 2012 (p. 3), 2013 (p. 3), 2014 (p. 3), 2015 (p. 3) 2016 (p. 3), 2017 (p.3), and 2018 (p. 3).

[170] ExxonMobil-XTO Hearing, p. 41 (United States Representative Jay Inslee: "Am I correct in assuming that your decision to enter into this acquisition in part is induced or motivated at least in part in a belief that we will be in some version of a carbon constrained world in the future in some sense? Is that one of your motivations?" [Rex Tillerson, ExxonMobil Chairman and CEO]: "…So it was in a consideration.").

[171] Cohen, Ken "ExxonMobil and the Carbon Tax," Energy Factor, December 2, 2015, https://energyfactor.exxonmobil.com/corporate-citizenship-sustainability/exxonmobil-and-the-carbon-tax.

- The 2010 *Outlook for Energy* report, in which the company stated that it expected that government climate change policies would "be equivalent to adding CO_2 costs of about $30 per ton in the OECD" by 2020, and $60 per ton by 2030.[172]

- The 2012 *Outlook for Energy* report, in which ExxonMobil anticipated "OECD CO_2 costs reaching about $80/ton by 2040." The company also projected that "Non OECD countries also will begin adding CO2 costs around 2030. By 2040, we see China reaching $30/ton and many other Non OECD nations approaching $20/ton."[173]

- The 2013 *Outlook for Energy* report, which disclosed that ExxonMobil applied a different GHG Emission Proxy Cost depending on whether a project was located in an OECD country ($40-80/ton), a leading non-OECD country ($20-40/ton), or a trailing non-OECD country (less than $20/ton).[174]

- The 2014 *Energy and Carbon - Managing the Risks* report, in which ExxonMobil stated that it applied a projected GHG Emission Proxy Cost to all its "significant proposed projects" and across "all our business segments." In addition, this report declared that "[ExxonMobil] address[es] the potential for future climate-related controls, including the potential for restriction on emissions, through the use of a proxy cost of carbon[, which] is embedded in our current *Outlook for Energy*, and […] seeks to reflect all types of actions and policies that governments may take over the Outlook period relating to the exploration, development, production, transportation or use of carbon-based fuels," clearly indicating that ExxonMobil applies a consistent proxy cost throughout the entire lifecycle of oil and natural gas.[175]

- The 2014 *Energy and Climate* report, in which ExxonMobil stated that it "requires that all business units use a consistent corporate planning basis, including the proxy cost of carbon […], in evaluating capital expenditures and developing business plans." The report further noted a $30 per ton 2040 projection for China and Mexico.[176]

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172 *The Outlook for Energy: A View to 2030*, ExxonMobil, 2010, (hereafter, *2010 Outlook for Energy*), p. 29.

173 *The Outlook for Energy: A View to 2040*, ExxonMobil, 2012, (hereafter, *2012 Outlook for Energy*), p. 30.

174 *The Outlook for Energy*; *The Outlook for Energy: A View to 2040*, ExxonMobil, 2013, (hereafter, *2013 Outlook for Energy)*, p. 34.

175 *Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, pp. 17, 18, 21.

176 *Energy and Climate*, ExxonMobil, March 31, 2014, pp. 6, 20.

69. While these disclosures only mention a few specific GHG Emission Proxy Cost estimates for a subset of years and regions, I understand that these estimates were based on detailed carbon price schedules that were put together by ExxonMobil's as part of its annual "Energy Outlook" business planning process.[177]

70. Additionally, in the Congressional Hearing regarding the XTO transaction, ExxonMobil's Chairman and Chief Executive Officer stated: "in all of [ExxonMobil's] investment decisions […and] economic modeling, [ExxonMobil] put[s] a carbon price in [its] economic decisions and project[ed] something for the future so that [it] at least [was] considering what the effects of our investment might be in the years to come."[178] Moreover, at ExxonMobil's 2016 Annual Shareholder Meeting, ExxonMobil's Chairman and Chief Executive Officer commented that "unlike many of our competitors, we have for many years included a price of carbon in our outlook. And that price of carbon gets put into all of our economic models when we make investment decisions as well. It's a proxy. We don't know how else to model what future policy impact might be. But whatever policies are, ultimately they come back to either your revenues or your costs. So we choose to put it in as a cost."[179]

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177 Examination of Todd Onderdonk (*Senior Energy Advisor, Economics & Energy, Corporate Strategic Planning, 2000-Present*), November 7-8, 2017, (hereafter, "Todd Onderdonk Tr.") pp. 290-291 ("Q And that's the kind of data that gets published in some kind of top line form in the public Energy Outlook and there's more detailed data and analysis in Exxon's internal version of the Outlook report, correct? A There is higher level demand"), pp. 400-401 ("This is a fairly detailed suite of data that's provided for internal organizations. […] It includes a broader set of data from the Energy Outlook and detail than what we've published in the external report."). *See, e.g.*, EMC 003212721, ExxonMobil 2012 EO GHG Emission Proxy Cost Basis, or EMC 002948182, ExxonMobil 2014 EO GHG Emission Proxy Cost Basis. I discuss ExxonMobil's Energy Outlook planning process in further detail in Section VI.A.1 *infra*.

178 ExxonMobil-XTO Hearing, p. 41.

179 "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2016, p. 29.

71. Based on my experience analyzing and valuing oil and gas companies, such public disclosures and statements would have likely led the Investment Community to conclude that ExxonMobil was consistently applying its publicly disclosed GHG Emission Proxy Cost to all of its business planning and investment decisions in the geographies where it expected increasingly stringent climate change regulations, particularly given the comments by ExxonMobil's Chief Executive Officer that explicitly state that GHG Emission Proxy Costs are applied to "***all*** of [ExxonMobil's] investment decisions" and "economic models" in the preceding paragraph (emphasis added).[180] As I discuss in further detail in the next section, such disclosures were a relevant consideration in the Investment Community's assessment of ExxonMobil.

C. Shareholder Proposals and Commentary by the Investment Community Demonstrate that Climate Change Regulatory Risk Is a Relevant Consideration in Their Assessment of ExxonMobil

1. Shareholder Proposals Demonstrate the Importance of ExxonMobil's Climate Change Risk Disclosures to Investors

72. Over the years, ExxonMobil's shareholders have consistently submitted proposals to the company demanding visibility into ExxonMobil's exposure to climate change related risk and disclosures regarding its strategies for managing those risks. These proposals demonstrate that ExxonMobil's shareholders have been concerned about ExxonMobil's exposure to and management of climate change related risk.

73. Exhibit 6 provides a list of the 13 shareholder proposals related to ExxonMobil's exposure to and management of climate change risk that were put up for a vote between

[180] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2016, p. 29.

2007 and 2018. It shows that ExxonMobil shareholders voted on at least one such proposal every year from 2007 to 2017 and that the proposals often received substantial shareholder support, with two such proposals eventually passing with a majority shareholder vote. Many of these proposals also received support from influential proxy vote advisors such as ISS, Glass, Lewis & Co. ("Glass Lewis"), or UK-based Pensions & Investment Research Consultants Limited ("PIRC").

74. Additionally, Exhibit 7 shows that there were at least nine other shareholder proposals from 2007-2018 that were withdrawn before being put up for a vote. Such proposals often led to a dialogue between the shareholders and ExxonMobil before being withdrawn. In some cases, these negotiations led to ExxonMobil taking actions or making disclosures relating to the proposals without even requiring a shareholder vote.[181]

75. Below I discuss some of these shareholder proposals in further detail. These examples illustrate the fact that such proposals received support from a broad group of ExxonMobil shareholders, indicating that climate change risk was a consideration in investors' assessment of the company.

- Every year from 2007-2015, shareholders put forth a proposal for ExxonMobil to set and publish GHG Emissions reduction targets. Though this proposal never received a majority vote, it still received up to 31 percent of shareholder support between 2007 and 2014.[182] The proposal, furthermore, received annual

[181] *See, e.g.*, Exhibit 7.

[182] Manhattan Institute, Proxy Monitor, http://www.proxymonitor.org/ (company "XOM", proposal "GREENHOUSE GAS EMISSIONS GOALS", proponent "Sisters of St. Dominic", 2007-2014).

endorsements from 2007 to 2014 from ISS.[183] In 2015, ISS withdrew support for the proposal following ExxonMobil's publication of the *Energy and Climate* and *Energy and Carbon - Managing the Risks* reports in 2014 prompted by another shareholder proposal. ISS's withdrawal of support was not because it considered the information no longer necessary; instead, ISS argued that following the publication of these reports, the company provided sufficient information to allow shareholders to assess the company's management of GHG Emissions.[184]

- Shareholders also sought enhanced transparency regarding ExxonMobil's approach to climate change risk through another proposal in 2010 and 2011, asking ExxonMobil to issue a report about the risks associated with its Canadian oil sands investments given doubts about long-term economic viability of the assets due to high extraction costs and the risk of rising GHG Emission costs and oil price fluctuations.[185] Although the measure did not pass in either year, the proposal was endorsed by ISS and received affirmative votes from holders of more than a quarter of ExxonMobil stock shares in both 2010 and 2011.[186] In its analysis of this proposal, ISS commented "[i]t would be beneficial for ExxonMobil to provide deeper insight to its shareholders into how it assesses the financial viability of oil sands development, including its assumptions of a price for carbon or financial impacts of carbon taxing regulations in the U.S. and/or Canada."[187]

- Later, in December 2013, shareholders from the Christopher Reynolds Foundation and Arjuna Capital submitted separate proposals reiterating shareholders' desire for more information about ExxonMobil's exposure to climate change risk. Specifically, the proposals asked ExxonMobil's Board of Directors to release reports about the company's strategic planning and long-term

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183 "Exxon Mobil Corporation," ISS, 2007-2014. ISS provides information and voting recommendations to shareholders in advance of company shareholder meetings. "The Global Leader in Corporate Governance & Responsible Investment," ISS, https://www.issgovernance.com/about/about-iss/.

184 "Exxon Mobil Corporation," ISS, 2015, p. 33 ("The company provides sufficient information regarding its greenhouse gas emissions to allow shareholders to assess the company's management of these emissions and related performance").

185 "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 26, 2010, pp. 16–17.

186 Presenting the proposal at the 2010 shareholder meeting, proponents from Green Century Capital Management cited "doubts about the long-term economic viability of oil sands development given the high cost of extraction and converting oil sands along with risk of future profitability presented by the rise in carbon cost and oil price fluctuation." ExxonMobil, Form DEF14A, 2010, pp. 62–63; ExxonMobil, Form DEF14A, 2011, pp. 64–65; "Exxon Mobil Corporation," ISS, 2010, p. 27; "ExxonMobil Corporation," ISS, 2011, p. 38; 2010 Shareholder Meeting, p. 32; "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2011, p. 34.

187 "Exxon Mobil Corporation," ISS, 2011, p. 38.

risk exposure on climate change.[188] These proposals were never voted on because ExxonMobil negotiated directly with each shareholder to drop the resolution in exchange for issuing reports that would satisfy the shareholders' concerns.[189] These reports — *Energy and Climate* and "*Energy and Carbon - Managing the Risks*" — were released on March 31, 2014.[190]

- In 2015, a collection of New York City pension funds submitted a "proxy access" proposal to amend ExxonMobil's bylaws and allow shareholders the right to nominate candidates for ExxonMobil's board.[191] At the 2015 shareholder meeting, the proponents announced that "ExxonMobil received this proposal due to its exposure to risks related to climate change."[192] The proxy access proposal also received support from ISS and other influential proxy vote advisors, including Glass Lewis and PIRC.[193] The proposal received affirmative shareholder votes representing 49.4 percent of company stock in 2015 and subsequently passed in 2016 with a 61.9 percent vote share.[194]

- In another 2016 proposal, the NYSCRF and the Church of England led a group of shareholders requesting an annual report from the Board on the long-term portfolio impacts of climate change.[195] The proposal, with support from ISS and Glass Lewis as well as institutional investors managing over $10 trillion in funds, including State Street, received affirmative votes from 38.1 percent of ExxonMobil stock shares that voted.[196] The same proposal was subsequently passed in 2017 with 62.1 percent voting in favor. ExxonMobil's two largest

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188 EMC 000525249, Dec. 11, 2013 letter from N. Lamb, Arjuna Capital to D. Rosenthal, ExxonMobil (cover letter to shareholder proposal); EMC 000525250 "Report on Carbon Asset Risk," Dec. 11, 2013; EMC 002402347 2014 Shareholder Proposal Summary: Item Report on Climate Risk; Mar. 17, 2014 SEC letter to ExxonMobil at Ex. A, at 33 (Dec. 9, 2013, Viederman letter to Rosenthal).

189 "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 28, 2014, p. 17; "Shareholders: ExxonMobil Takes Crucial Step of Acknowledging Carbon Asset Risk ... But More is Needed," Arjuna Capital, March 31, 2014, http://arjuna-capital.com/news/shareholders-exxonmobil-takes-crucial-step-of-acknowledging-carbon-asset-risk-but-more-is-needed/.

190 "ExxonMobil Releases Reports to Shareholders on Managing Climate Risk," ExxonMobil, March 31, 2014, https://news.exxonmobil.com/press-release/exxonmobil-releases-reports-shareholders-managing-climate-risk.

191 ExxonMobil, Form DEF14A, 2015, pp. 64–65.

192 "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 27, 2015, p. 17.

193 "Exxon Mobil Corporation," ISS, 2015 (p. 21) and 2016 (p. 27); Burr, Barry, "Glass Lewis in Favor of Climate-Change Risk, Proxy Access Proposals at Exxon Mobil," MSCI, May 6, 2016; "PIRC Report for 2016," April 29, 2016, p. 5.

194 2015 Shareholders Meeting, p. 37; "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2016, p. 33.

195 ExxonMobil, Form DEF14A, 2016, pp. 69–70.

196 2016 Shareholder Meeting, p. 20; "ExxonMobil Corporation," ISS, 2016, pp. 2, 53; ISS Voting Analytics.

shareholders, Vanguard and BlackRock, joined ISS, Glass Lewis, and State Street that year in supporting the proposal.[197]

2. *Commentary from ExxonMobil's Investors Indicates that They Considered ExxonMobil's Exposure to Climate Change Regulatory Risk*

76. In addition to considering climate change related risk in their investment process, as discussed above in Section IV.B, a number of ExxonMobil's largest institutional investors have also highlighted the importance of considering such risk in their assessment of ExxonMobil specifically.

77. Investor commentary demonstrates that large institutional investors specifically considered ExxonMobil's representations regarding its use of its GHG Emission Proxy Cost in their assessments of the company. For example, Vanguard, in an analysis of ExxonMobil's vulnerability to Climate Change Regulatory Risk, specifically noted ExxonMobil's use of GHG Emission Proxy Cost in an "effort to quantify what [it] believes government policies over the Outlook period could cost to [its] investment opportunities."[198] Similarly, in State Street's notes regarding a 2017 meeting with ExxonMobil, State Street noted that "the price of carbon is used [by ExxonMobil] as a modeling tool and [ExxonMobil] has used this since 2007."[199]

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[197] ExxonMobil, Form DEF14A, 2017, pp. 62–63; ISS Voting Analytics voting records; "ExxonMobil Corporation," ISS, 2017, p. 51. VGI1920, May 23, 2017 Internal Vanguard memorandum supporting proxy proposal for enhanced climate disclosure, p. 2; "Victory for ExxonMobil Shareholders as Climate Change Disclosure Resolution Receives Majority Support Despite Company Opposition," The Church of England, May 31, 2017, https://www.churchofengland.org/more/media-centre/news/victory-exxonmobil-shareholders-climate-change-disclosure-resolution.

[198] VGI1211, 2016 memorandum "Exxon E&S Analysis" (quoting *Energy and Carbon - Managing the Risk*, p. 18); VGI0938-0941, "In House Climate Change Risk Assessment (CVX & XOM)."

[199] SSC_NYAG_0001948, 3/17/2017 summary of meeting between State Street and ExxonMobil (Woodbury, Trelenberg, and Luettgen) p. 4.

78. Additionally, as discussed above in Section V.C.1, BlackRock, State Street, and Vanguard supported a resolution that ExxonMobil "publish an annual assessment of the long-term portfolio impacts of technological advances and global climate change policies…and should analyze the impacts [of] the globally agreed upon 2 degree target." BlackRock explained that it voted for that proposal only after extensive discussion with ExxonMobil management on climate risk failed to convince the company to make sufficient disclosures about its approach to climate risk and that the reason for the engagement was its "assessment that there is potential for material economic ramifications for shareholders."[200] BlackRock's sustained engagement with ExxonMobil is yet another example that illustrates investors' interest in ExxonMobil's climate change related disclosures.

79. Other major institutional shareholders have also closely monitored ExxonMobil's measures to mitigate the risks of climate change. For instance, in 2013, CalSTRS requested a "dialogue [with ExxonMobil] on fossil fuel reserve calculation and valuation in light of the Carbon Tracker report titled *Unburned Carbon 2013-Wasted Capital and Stranded Assets*," which stated that 60-80 percent of reserves held by publicly listed

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[200] "Supporting a Shareholder Proposal Following Extensive Management Engagement," BlackRock https://www.blackrock.com/corporate/literature/press-release/blk-vote-bulletin-exxon-may-2017.pdf ("BlackRock has been engaging in direct and private dialogue with Exxon over several years on a wide range of governance issues that we believe have long-term economic implications for investors, ... including on the management and reporting of climate-related risk. […] In addition, we have repeatedly requested to meet with independent board directors over the past two years to better understand the board's oversight of the company's long-term strategy and capital allocation priorities amidst major strategic challenges and regulatory inquiry (including but not be *[sic]* limited to oversight of climate risk). The company declined to make directors available, citing a non-engagement policy between independent board members and shareholders."); BlackRock, Long term Sustainable Investment Questionnaire, p. 6.

companies may become stranded.[201] Also in 2013, Walden Asset Management wrote a letter to Rex Tillerson urging ExxonMobil "to limit the greenhouse gas emissions from its operations," because of Walden's belief that "fossil fuel companies are particularly at risk" from climate change and climate change regulation.[202] In yet another example, the NYSCRF expressed satisfaction that its 2017 shareholder proposal had passed and promised to "continue to monitor ExxonMobil's response to climate change as we urge the company, and others in the energy sector, to find ways that they can adapt to the growing lower carbon economy."[203]

3. Commentary from Equity Research Analysts Indicates that They Considered Climate Change Regulatory Risk in Their Assessment of ExxonMobil

80. Similar to ExxonMobil's investors, commentary from equity research analysts covering ExxonMobil's stock also indicates that they consider Climate Change Regulatory Risk in their assessment of the company. These equity analysts have consistently highlighted the risk of climate change to ExxonMobil's business, considering the possibility of reduced demand, higher costs, and stranded assets due to future regulations. Many analysts, moreover, have taken note of ExxonMobil's Climate Change Regulatory Risk disclosures and commented specifically on ExxonMobil's use of GHG Emission Proxy Cost in its financial planning models.

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201 EMC 001403266, "2013 Institutional Shareholder Call - CalSTRS," CalSTRS.

202 EMC 000538036-037, Letter from Walden Asset Management to Rex Tillerson, September 27, 2013.

203 "NYS Comptroller DiNapoli: ExxonMobil Agrees to Assess Impacts of Climate Change," Office of the New York State Comptroller, December 12, 2017, https://www.osc.state.ny.us/press/releases/dec17/121217.htm.

81. In fact, at least 15 of the 16 major investment banks covering ExxonMobil whose reports I reviewed have discussed Climate Change Regulatory Risk faced by ExxonMobil since 2010. The 16 investment banks were selected as they had covered ExxonMobil for the longest period starting in 2010.[204] I identified 99 reports published by these banks as having relevant discussion regarding ExxonMobil's Climate Change Regulatory Risk or GHG Emission Proxy Cost. Out of these 99 reports, 53 were published in 2016 or earlier, suggesting that analysts were interested in ExxonMobil's exposure to Climate Change Regulatory Risk while alleged misrepresentations regarding ExxonMobil's use of GHG Emission Proxy Cost were ongoing. Exhibit 8 provides a list of relevant quotes from these analysts, and in the sections below I discuss some of the key ones in further detail.

a. *Analysts Have Highlighted ExxonMobil's Exposure to Climate Change Regulatory Risk*

82. Since as early as 2010, analysts have expressed their concerns about the potential for climate change regulations to negatively affect ExxonMobil's business prospects. For example:

- In 2010, RBC was concerned that "ExxonMobil's downstream earnings could be lowered by costs related to greenhouse gas emission legislation […]."[205]
- In 2016, Société Générale worried that "[f]uture climate change regulations or taxes that limit the company's ability to exploit reserves, make them prohibitively

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[204] The length of coverage of each bank since 2010 was determined by looking at the date of the earliest and latest report published by each bank and available through Thomson One's Investext subscription. These banks include Barclays, Bank of Montreal ("BMO"), Cowen & Company, Credit Suisse, Deutsche Bank, Evercore ISI, HSBC, Jefferies, JPMorgan, Macquarie, Morgan Stanley, Oppenheimer, RBC, Société Générale, UBS, and Wells Fargo.

[205] Rousseau, Jacques, "Initiating Coverage: Looking Past the XTO Acquisition," RBC, April 22, 2010, p. 4.

expensive to extract, or significantly curtail demand for end petroleum products, could materially impact the company's value."[206]

- Later in 2016, BMO Capital Markets included climate change among its "weaknesses and threats" to ExxonMobil, stating that it was "a tough job being an oil major these days, especially so if you are the biggest" because "climate change threatens stranding resources long term."[207]

83. Beyond merely noting the company's exposure to Climate Change Regulatory Risks, equity research analysts have also asked ExxonMobil to release more details about those risks to its GHG Emission-intensive assets.[208] Given the importance of oil sands production to ExxonMobil's overall portfolio, it is not surprising that the analysts highlight the potential threat of current and future GHG Emission regulations for these projects.[209]

b. *Analysts Have Taken Notice of ExxonMobil's Disclosures Related to Climate Change Regulatory Risk*

206 Herrlin, John *et al.,* "ExxonMobil: Increase TP, as Market Re-Rates Sector on Higher Oil Prices," Société Générale, March 22, 2016, p. 1.

207 Warn, Brendan and Nikolas Stefanou, "Gold Standard: Initiating with Market Perform and $78 Target Price," BMO, December 1, 2016, p. 11.

208 For example, in a 2011 analyst report, Barclays expressed a desire to learn more about how GHG Emission Proxy Cost could affect the Kearl project, asking, "Kearl oil sands development – what is the unit operating cost? What additional cost have you built in for the expected new carbon tax scheme?" Cheng, Paul Y., Christina Cheng, and Danielle Diamond, "Exxon Mobil Corp.: Analyst Day Preview," Barclays, March 7, 2011, p. 3. It appears that the Barclays analysts had still not received an adequate answer to these questions in 2012, when the analysts repeated them verbatim in another report in that year. Cheng, Paul Y., Eli Bauman, and Anthony Kit, "Exxon Mobil Corp.: Analyst Day Preview," Barclays, March 5, 2012, p. 4.

As I discuss below, analysts also requested additional information about ExxonMobil's use of GHG Emission Proxy Cost on company earnings calls in 2015 and 2016. 2015 Q2 Transcript of Exxon Mobil Corp. Earnings Call, Thomson Reuters, July 31, 2015, p. 18; 2016 Q2 Transcript of Exxon Mobil Corp. Earnings Call, Thomson Reuters, July 29, 2016, p. 25.

209 For example, BMO analyst noted, "oil sands provide the worst margins in [ExxonMobil's] portfolio" making them [perhaps the most] sensitive to GHG cost regulations. *See* Warn, Brendan and Nikolas Stefanou, "ExxonMobil: Gold Standard: Initiating with Market Perform Rating, $78 Target Price," BMO, December 1, 2016, p. 18.

84. When ExxonMobil has complied with analyst and investor requests to provide additional clarity on its approach to Climate Change Regulatory Risk, analysts have taken notice of such disclosures.

- Following the release of the *Energy and Carbon – Managing the Risks* and *Energy and Climate* reports in 2014, Standard & Poor's Rating Services acknowledged "ExxonMobil recently became the first oil and gas producer to agree to publish details of its climate risk exposure from stranded assets…a sign of the growing acceptance among companies and investors that climate and carbon risks are increasingly material to corporate performance and value."[210]
- In 2014, UBS also wrote "ExxonMobil released its reports [*Energy and Carbon – Managing the Risks* and *Energy and Climate*] yesterday to shareholders on managing climate risk. The company says that its hydrocarbon reserves are unlikely to become 'stranded' because of regulations to limit climate change. It says limiting the temperature increase to 2°C would be too costly given the growing energy needs."[211]

85. In particular, analysts have considered ExxonMobil's representations regarding its use of GHG Emission Proxy Cost to account for those risks. For instance, numerous analysts have cited ExxonMobil's representations regarding its use of publicly disclosed GHG Emission Proxy Cost over the years.[212] Moreover, analysts have found ExxonMobil's use of GHG Emission Proxy Cost to be a reassuring measure of ExxonMobil's exposure to climate change regulations and highlighted the importance of including such a measure

210 "Special Report: Climate Change: Preparing for the Long Term," *Credit Week*, S&P, May 28, 2014, p. 32.

211 Rigby, Jon, Amy Wong, and Marina Postnikova, "Daily Oil News: Key Headlines," UBS, April 1, 2014, p. 3.

212 *See, e.g.*, Knight, Zoe, Wai-Shin Chan, and Ashim Paun, "Keeping It Cool: Moving Towards Global Carbon Pricing," HSBC, September 2015, p. 11. *See also* Sankey, Paul, David T. Clark, and Silvio Micheloto, "ExxonMobil: XOM-XTO Hearing; Oil Industry Keeps Rising in DC," Deutsche Bank, January 21, 2010, p. 1; Coster, Paul, Mark Strouse, and Paul J. Chung, "Alt Energy: COP21 Paris Climate Conference - Lead, Follow or Get Out of the Way," JPMorgan, December 16, 2015, p. 4; Read, Roger D. and Lauren Hendrix, "XOM: Investor Meeting Highlights," Wells Fargo, May 30, 2016, p. 2.

comprehensively in company's business planning. For example, in 2016 Wells Fargo stated:

> To guard against future expenses related to GHG regulations, a direct carbon tax or carbon trading schemes, [ExxonMobil] places a proxy cost of carbon on all of its future developments. Depending on the project and its location, the proxy cost of carbon ranges from $20 to $80 per ton by 2040. This approach reduces the risks associated with future CO2 emissions and incentivizes [ExxonMobil] to reduce overall emissions of all future projects. Also, all future project economics will not be negatively affected by future GHG rules, regulations and taxes. This approach also helps [ExxonMobil] avoid the risk of stranded investments.[213]

86. Based on ExxonMobil's representations regarding GHG Emission Proxy Cost, Wells Fargo analysts also believed ExxonMobil was "ahead of the curve on pricing in climate risks"[214] and in 2017, reiterated the importance of taking into account the GHG Emission Proxy Cost in all "long-lived projects to ensure full-cycle returns are fairly evaluated on an environmental basis as well as financial and operational."[215]

87. Additionally, analysts have also often shown an interest in better understanding how GHG Emission Proxy Cost is applied in ExxonMobil's business planning and investment decisions, indicating that they followed ExxonMobil's statements about its use of GHG Emission Proxy Cost in its business decisions. For example, in a 2015 earnings call, an

[213] Read, Roger D. and Lauren Hendrix, "XOM: Investor Meeting Highlights," Wells Fargo, May 30, 2016, p. 2.

[214] Read, Roger D. and Lauren Hendrix, "XOM: Some Smoke But Likely No Fire; Lowering Valuation Range," Wells Fargo, September 20, 2016, p. 1.

[215] Read, Roger D. and Lauren Hendrix, "XOM: Sellside Lunch Highlights," Wells Fargo, August 17, 2017, p. 2. Moreover, in preparation for a meeting with ExxonMobil investors, ExxonMobil management commented that "[w]e test our upstream projects based on the scope 1 emissions [direct emissions from the project] they will create," Guy Powell, Tr., exhibit 10.

analyst from Tudor, Pickering, Holt & Company sought to understand how the company accounted for potential increases in GHG Emission costs in evaluating its oil sands projects.[216] Similarly, in a 2016 earnings call, an analyst from Raymond James & Associates, Inc. asked whether ExxonMobil incorporated GHG Emission Proxy Cost in its "project economics planning." In response, ExxonMobil's Vice President of Investor Relations & Secretary said "if you look in our energy outlook…you'll see that we've included for – now for many years a, what we call a proxy cost of carbon." Thus, ExxonMobil's own representative tied the same GHG Emission Proxy Cost to ExxonMobil's planning functions and Energy Outlook.[217]

VI. EXXONMOBIL'S APPLICATION OF GHG EMISSION PROXY COST IN ITS BUSINESS PLANNING AND INVESTMENT DECISIONS WAS INCONSISTENT WITH ITS PUBLIC DISCLOSURE

88. I find that ExxonMobil's practices of accounting for Climate Change Regulatory Risk and its GHG Emission Proxy Costs were inconsistent with its public disclosures regarding these risks and costs. As discussed in Section V.B, ExxonMobil has represented that it has consistently applied a GHG Emission Proxy Cost in its business

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216 2015 Q2 Transcript of ExxonMobil Earnings Call, Thomson Reuters, July 31, 2015, p. 18 ("When you look at your oil sands projects, they're relatively high cost impacted by potential carbon pricing, and higher taxes coming through. […] given those are your key areas, how comfortable are you with those areas and the potential growth there."). Equity research analysts from 17 firms participated on this earnings call.

217 2016 Q2 Transcript of ExxonMobil Earnings Call, Thomson Reuters, July 29, 2016, p. 25 ("[… w]ithin Exxon's project economics planning, do you incorporate a future carbon price?" ExxonMobil's VP of IR & Secretary responded: "[I]f you look in our energy outlook, which we've got posted on our Company website, you'll see that we've included for -- now for many years a, what we call a proxy cost of carbon. And over the outlook period out to 2040, that number grows to as high as $80 per ton. But you'll see it in our energy outlook, if you go ahead and take a look at it."). Equity research analysts from 16 firms participated on this earnings call.

planning since 2007,[218] and since at least 2010, the company has published estimates of future GHG Emission Proxy Cost.[219] I understand that these estimates are based on ExxonMobil's detailed GHG Emission Proxy Cost schedules prepared as part of its Energy Outlook business planning process and, over time, these estimates covered more and more geographic areas. Additionally, in its 2014 public disclosures in the *Energy and Carbon - Managing the Risks* and *Energy and Climate* reports, ExxonMobil represented that it has employed a "consistent corporate planning basis" and applied a projected GHG Emission Proxy Cost to all of its "significant proposed projects" and across "all [its] business segments."[220]

89. Moreover, as discussed in the previous section, ExxonMobil's disclosures regarding its exposure to Climate Change Regulatory Risk and its use of a GHG Emission Proxy Cost in its business planning were relevant to the Investment Community's assessment of ExxonMobil's business. Based on my review of commentary from the Investment Community and my prior experience analyzing and valuing oil and gas companies, ExxonMobil's public disclosures related to GHG Emission Proxy Cost would have likely led the Investment Community to conclude that ExxonMobil was consistently applying these costs to all of its business planning and investment decisions.

90. However, based on my review of ExxonMobil's internal business planning documents and corporate planning and investment decision financial models, I find that

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218 Cohen, Ken "ExxonMobil and the Carbon Tax," Energy Factor, December 2, 2015, https://energyfactor.exxonmobil.com/corporate-citizenship-sustainability/exxonmobil-and-the-carbon-tax.

219 *See supra* Section V.B.

220 *Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, pp. 18, 21; *Energy and Climate*, ExxonMobil, March 31, 2014, pp. 6, 20.

ExxonMobil's practices of accounting for GHG Emission Proxy Cost were inconsistent with its public representations in at least two areas. First, ExxonMobil did not apply the GHG Emission Proxy Cost consistently in its annual end user demand projections for the overall global oil and gas industry. Second, in the set of corporate planning and investment decision financial models I reviewed, in almost all years, ExxonMobil applied either a GHG Emission Proxy Cost that was lower than what it had publicly disclosed, or no GHG Emission Proxy Cost at all. I discuss these inconsistencies in ExxonMobil's application of GHG Emission Proxy Cost in further detail below.

A. ExxonMobil's Oil and Gas Demand Projections Did Not Consistently Adopt Its Publicly-Disclosed GHG Emission Proxy Cost

1. Overview of ExxonMobil's Energy Outlook Demand Projection Process

91. As discussed previously, fossil fuels generate GHG Emissions not only when they are extracted and refined to produce oil and gas products, but also when end users consume those products. Correspondingly, stricter climate change regulations could be aimed at imposing higher costs on the consumption of refined products and directly curbing the end user demand for such oil and gas products. Numerous industry analysts have predicted that such stricter climate change regulations should lead to declining fuel demand in the coming years.[221]

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[221] *See, e.g.*, Herrmann, Lucas and Tom Robinson, "European Integrated Oil 2017 Outlook: Hitting a Sweet Spot," Deutsche Bank, December 6, 2016, p. 46 ("[…] as host countries ratify the Paris COP21 accord […] the question is no longer will supply constrain demand, but rather when will oil demand move into decline[…]."). *See also* Rigby, Jon "European Oil and Gas 2019 Outlook - More of the Same," UBS, December 17, 2018, p. 11 ("[T]he most likely trajectory for oil demand means we would miss the implied targets consistent with the Paris

92. ExxonMobil itself recognizes the impact such climate change regulations could have on end user fuel demand.[222] For instance, ExxonMobil's 2014 *Outlook for Energy* stated that "[n]atural gas is likely to grow in use as a transportation fuel, with its attractiveness enhanced by its relatively low emissions."[223] Another ExxonMobil report in 2018 estimated that if climate change regulations become sufficiently stringent to meet the Paris Agreement's two-degree target, it would result in a 0.4 percent decrease in demand for oil every year. That is an especially noteworthy decline, considering future population and GDP growth should boost demand for all fuels.[224]

93. As a result, ExxonMobil undertakes an annual review process called Energy Outlook that develops its projections for "global fuel demand by assessing demand and supply at country, sector and fuel level."[225] This review process is carried out by ExxonMobil's Energy Outlook Group in conjunction with the Environmental Policy and Planning Group.[226] ExxonMobil subsequently publicly discloses the results of this process in its annual *Outlook for Energy* reports, which it has published every year since 2006.[227, 228] In

Accord. [To meet those targets, p]oliticians and policy makers may try to bend [the demand] curve by introducing more consequential measures on the use of oil and gas.").

222 *2018 Energy and Carbon Summary*, ExxonMobil, p. 8.

223 *The Outlook for Energy: A View to 2040*, ExxonMobil, 2014, (hereafter, *2014 Outlook for Energy*), p. 22.

224 *2018 Energy and Carbon Summary*, ExxonMobil, p. 8.

225 EMC 002532516, March 14, 2011 email from Todd Onderdonk to Jennifer Linker re: energy outlook questions, p. 1.

226 Both the Energy Outlook Group and Environmental Policy and Planning Groups are within ExxonMobil's Corporate Strategic Planning Group. Examination of William Colton (*VP, Corporate Strategic Planning, 2009-present)*, June 27-28, 2017, (hereafter, "William Colton Tr."), pp. 19-21; Todd Onderdonk Tr., p. 351.

227 Todd Onderdonk Tr., p. 37; *2014 Outlook for Energy*, p. 2.

228 In 2011, ExxonMobil updated its naming conventions for the *Outlook for Energy* report – usually published in Q4 – to reflect the upcoming year, as opposed to the current year. The 2010 *Outlook for Energy* was published

addition, ExxonMobil senior management conducts presentations to investors, governments, and industry groups using the data contained in these annual reports.[229] ExxonMobil has publicly stated that the "outlook" developed from the Energy Outlook process "forms the foundation for the company's business strategies and helps guide investment decisions."[230]

94. The Energy Outlook process covers the major global industry sectors that drive fuel demand, including residential, commercial, agricultural, chemical, energy industry, heavy industry, and transportation sectors.[231] The sector-level demand projections are based on a broad range of drivers that vary across sectors. These drivers include factors such as the number of households, GDP growth forecasts, and historical demand data for different countries and regions.[232]

95. Additionally, as part of the Energy Outlook process, ExxonMobil also constructs detailed GHG Emission Proxy Cost projections, which according to ExxonMobil, intend to "address[] the potential for future climate change policy, including the potential for restrictions on emissions" and "seek[] to reflect potential policies governments may

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in late 2010, but later *Outlook for Energy* reports were published at the end of the year prior to which they were dated.

229 Todd Onderdonk Tr., pp. 43-44.

230 "2015 Corporate Citizenship Report," p. 38.

231 EMC 002855106, Memo from Todd Onderdonk, December 1, 2016, p. 1.

232 EMC 002532516, Email from Todd Onderdonk to Jennifer Linker re: energy outlook questions, March 14, 2011, p. 1.

employ related to the exploration, development, production, transportation and use of carbon-based fuels."[233]

96. To model the potential impact of future climate change regulations on sector-level end user fuel demand, ExxonMobil claims that it added the forecasted GHG Emission Proxy Cost to the fuel price assumptions it used in its demand projections.[234] Then based on the resulting adjusted fuel prices and assumptions regarding demand price elasticity for the sectors, ExxonMobil estimated the projected end user fuel demand for each sector and country.[235] However, as I discuss below, ExxonMobil did not apply the GHG Emission Proxy Cost consistently in its demand projections or corporate planning and investment decisions.

2. *ExxonMobil Did Not Consistently Apply Its Publicly-Disclosed GHG Emission Proxy Cost in Its Demand Projections*

97. For most other sectors, ExxonMobil added the forecasted GHG Emission Proxy Cost to its fuel price assumptions it used in the Energy Outlook process.[236] For the transportation sector, however, ExxonMobil did not add any GHG Emission Proxy Cost to the projected fuel prices as it did for the other sectors.[237]

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[233] EMC 002871205, "GHG Overview Comments," 2016, p. 1.

[234] EMC 002855106, Memo from Todd Onderdonk, December 1, 2016, p. 1.

[235] EMC 002855106, Memo from Todd Onderdonk, December 1, 2016, p. 1.

[236] Todd Onderdonk Tr., pp. 257-268.

[237] *See, e.g.*, EMC 002855106, Memo from Todd Onderdonk, December 1, 2016. *See also* Todd Onderdonk Tr., pp. 257-268.

98. Instead, for the segments within the transportation sector, ExxonMobil only accounted for the potential impact of climate change regulations on sector demand resulting from anticipated fuel efficiency improvements for different types of vehicles.[238] For instance, in the light duty segment of the sector, ExxonMobil's demand projections were based on the anticipated effects of existing and potential future vehicle efficiency standards that car manufacturers may be required to meet in certain countries.[239] These vehicle efficiency standards, such as the 2012 U.S. Corporate Average Fuel Economy ("CAFE") standards, require new cars to achieve certain minimum fuel efficiency targets.[240] Similarly, in other segments such as heavy duty, aviation, marine, and rail, ExxonMobil only considered anticipated fuel efficiency improvements due to anticipated requirements or improved technology.[241] ExxonMobil claims that any GHG Emissions-related effect on fuel demand for the sector should, to a large degree, already have been reflected in such fuel efficiency requirements or improvements.[242]

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238 *See, e.g.,* EMC 003212719, "2011 Energy Outlook Key Drivers and Guidelines by Sector," at worksheet entitled "Price and CO2 Modelling." *See also* Todd Onderdonk Tr., pp. 257-268.

239 Furthermore, for some other regions in which ExxonMobil did not "have adequate data," ExxonMobil did not model even the impact of fuel efficiency regulation in its demand projections. Thus, for these countries, the potential effect of future climate change regulations does not appear to factor directly into ExxonMobil's demand projections for the sector at all. Todd Onderdonk Tr., pp. 257-262.

240 Halpert, Julie, "What if U.S. Fuel Economy Standards Went Away?" Ensia, June 21, 2018, https://ensia.com/features/fuel-standards/.

241 *See, e.g.,* EMC 003739418, "2017 Energy Outlook Transportation Deeper Dive," August 2, 2016, p. 14. *See also* Todd Onderdonk Tr., pp. 266-267 ("Q. Besides light duty vehicles, what sectors do you, instead of using the proxy cost, use a similar regulatory analysis to what you described with the CAFE standards? A. The heavy duty sector, basically trucks and buses, we use an energy intensity indicator of projected demand in the future. Similar approach for the aviation sector. The marine sector, as well, is one where we looked at potential efficiency gains affecting the overall demand for marine fuels. The rail sector, trains. Again, we're looking overall energy intensity gains relative to the GDP and/or population.").

242 *See, e.g.*, EMC 002855106, Memo from Todd Onderdonk, December 1, 2016 ("In the transportation sectors, at this point we currently assume that CO2 costs are reflected to a large degree by efficiency standards (e.g. CAFE

99. ExxonMobil's rationale, however, for not considering the GHG Emission Proxy Cost in its demand projection for the transportation sector is flawed and internally inconsistent. This rationale fails to account for the fact that end users in the transportation sector could also face higher fuel prices due to GHG Emission costs, consistent with ExxonMobil's view of other sectors. The fact that such products may be used more efficiently by the transportation sector and therefore emit fewer GHGs per mile driven or traveled does not prevent governments from potentially proposing other regulations that increase the price of such products to curb consumption and in turn reduce GHG Emissions even further.[243]

100. Had ExxonMobil applied GHG Emission Proxy Cost to its transportation sector, as it did for the other sectors, it would have projected a higher "all-in" price that end users in the sector could face and consequently lower end user demand for that sector.[244] Moreover, given the fact that the transportation sector is expected to represent more than half of the worldwide demand for crude oil, ExxonMobil's failure to appropriately account for fuel demand in this sector would likely also have had a substantial impact on its overall global

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in the U.S.)."). *See also* EMC 002532516, Email from Todd Onderdonk to Jennifer Linker re: energy outlook questions, March 14, 2011, ("our views for the future are predicated to a large degree by actual and/or anticipated policies (e.g. CAFE in U.S., and CO2 g/km targets in Europe). I'll also note that we generally assume continued efficiency gains beyond those identified in the near-to-mid-term by light duty vehicle mandates."); Onderdonk Tr., pp. 266-267.

[243] ExxonMobil's GHG Emission Proxy Cost is meant to "comprehensively reflect potential policies governments may employ related to managing the risks of climate change," and to "reflect all types of actions and policies that governments may take." The company's indirect and incomplete accounting for climate change regulatory risk in the transportation sector, on the other hand, only reflects a limited set of those potential government policies. "Climate Change 2017 - Exxon Mobil Corporation, CDP, 2017 at CC2.2d; *Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, p. 17.

[244] I note that a higher "all-in" price could be due to taxes imposed on the end user and does not imply that ExxonMobil receives higher revenue than it would with a lower "all-in" price.

fuel demand projections.[245] Since ExxonMobil uses these demand calculations to inform its business planning and investment decisions, an inflated outlook on the fuel demand in the transportation sector would also have, consequently, likely led ExxonMobil to also project an inflated demand for its products.[246] Based on my experience analyzing and valuing oil and gas companies, such inflated projections would have likely positively biased the Investment Community's assessment and valuation of ExxonMobil.

B. ExxonMobil Did Not Apply Its Publicly-Disclosed GHG Emission Proxy Cost Consistently in Corporate Planning and Investment Decision Financial Models

1. Overview of ExxonMobil's Corporate Planning and Investment Decision Review Processes

101. In addition to its annual Energy Outlook process, ExxonMobil also carried out reviews of capital budgeting plans and portfolio assets as part of its annual corporate planning process and evaluated potential investment opportunities as part of its investment decision process.[247]

102. As part of ExxonMobil's corporate planning and investment decision processes, it used financial models to calculate future cash flows and financial returns for each asset and

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245 EMC 003739418, PowerPoint presentation titled, "2017 Energy Outlook: Transportation Deeper Dive," August 2, 2016, notes to p. 7.

246 *See, e.g.,* William Colton Tr., p. 77 ("the Energy Outlook will tell us how much crude oil the world needs through the forecast horizon, and then we separately take that and put it into a model to say, well, if the world needs this much crude oil, where the supply is going to come from, we're able to run a model looking at the cost of those supplies and we use that to match against the demands and develop a curve looking at a price forecast, which we look at. […] it's fundamentally driven by a supply/demand model. […] that becomes guidance for the businesses as they try to understand what the return for their projects will be in terms of what the prices are.").

247 Examination of Mark Shores, (*Planning Manager for Corporate Strategic Planning, 2014-present*), December 7-8, 2017 (hereafter, "Mark Shores Tr."), pp. 46-49.

potential investment.[248] Many assumptions that underlie these financial models were based on corporate planning and guidance documents ("Dataguides") that were revised annually.[249] The Dataguides were designed to highlight key objectives and strategic directions for ExxonMobil's businesses and contained guidance on key financial and operating parameters that were intended to help frame objectives for ExxonMobil's businesses over the planning period.[250] ExxonMobil's business line managers were expected to follow the Dataguides unless they had been granted an exception.[251]

103. One of the parameters included in the Dataguides was ExxonMobil's internal GHG Emission Proxy Cost schedules, which projected the estimated dollar cost per ton of GHG Emissions into the future. These projected costs varied for different regions around the world and were designed to reflect the projected effects of both current and potential future climate change regulations.[252] These internal schedules were revised annually, and it was expected that the financial models used by ExxonMobil for its corporate planning and investment decision processes would contain a specific line item for GHG Emission Proxy Costs.[253]

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248 William Colton Tr., p. 38.

249 William Colton Tr., pp. 85-86, 89; Mark Shores Tr., p. 73.

250 *See, e.g.*, 2015 ExxonMobil Corporate Planning Dataguide p. 5 ("The 2015 Plan should highlight the key objectives and strategic direction for each company. However, the focus of the Plan should remain on how those strategies will be implemented over the plan period and the anticipated results. The 2015 Plan is the vehicle for establishing each Company's financial and operating stewardship objectives for the year 2016 and for establishing the context for endorsement of the Company's original budget and capital expenditure.").

251 William Colton Tr., pp. 179-80, 276.

252 *See, e.g.*, 2015 ExxonMobil Corporate Planning Dataguide Appendices, p. 31. *See also* Examination of Robert Bailes, (*Corporate GHG Manager, 2009-2014*), July 19-20, 2017, p. 72.

253 William Colton Tr., pp. 246-247.

2. *ExxonMobil Did Not Consistently Apply Its Publicly-Disclosed Proxy Costs in Its Financial Models*

104. As discussed in Section V.B, ExxonMobil has publicly stated that as part of its corporate planning and investment decision processes it "requires that all business units use a consistent corporate planning basis, including the proxy cost of carbon […], in evaluating capital expenditures and developing business plans."[254] Moreover, ExxonMobil has also stated that it applied a projected GHG Emission Proxy Cost to all its "significant proposed projects" and across "all our business segments."[255] Based on my experience analyzing and valuing oil and gas companies, ExxonMobil's public disclosures and statements would have led the Investment Community to likely conclude that ExxonMobil was consistently applying its publicly disclosed GHG Emission Proxy Cost to its business planning and investment decisions.[256] However, ExxonMobil's corporate

[254] *Energy and Climate*, ExxonMobil, March 31, 2014, p. 20.

[255] *Energy and Carbon – Managing the Risks*, ExxonMobil, March 31, 2014, pp. 18, 21.

[256] I understand that ExxonMobil's reserves modeling exercise was part of its corporate planning process, and should have also incorporated the GHG Emission Proxy Cost. *See, e.g.*, Deposition of Richard Ducharme (*Global Reserves Manager, 2016-present*), April 2, 2019, p. 53 ("Q. And why does Exxon assess Company Reserves? A. Because it's an outcome from our Company Planning process."), pp. 56-57 ("Q. And how are those reserve models used in Exxon's business planning process? A. They built our models with inputs. Those inputs are what goes into the Company Plan. Q. Is the Company Plan the same as the Corporate Plan? A. It is, yes. Q. And that's the annual corporate planning process? A. That's correct."), pp. 60-61 ("Q. And are GHG costs incorporated into reserves models? […] A. So the plan, the Company Plan is built following the Corporate Dataguide as input. […] Q. And you said that GHG costs are listed in the Corporate Dataguide; is that correct? A. Correct. Q. So are GHG costs incorporated into reserves models? […] A. Again, they're incorporating the guidance from the Corporate Dataguide."). *See also* Commercial Division Rule 11-f Deposition of ExxonMobil, by Brant Edwards (*ExxonMobil's Vice President of Upstream Development and Planning*), April 30, 2019 pp. 303-304 ("Q. Mr. Edwards, we have been discussing reserves and resources. What is the purpose of Exxon's classification of volumes of oil and gas into reserves and resources, putting aside regulatory requirements? … A. Well, it's part of our annual planning and budget exercise.")

planning and investment decision financial models that I reviewed apply the GHG Emission Proxy Cost in a manner contrary to its public representations.

105. First, the GHG Emission Proxy Cost schedules that were included in the Dataguides were significantly lower in many years than those that were publicly disclosed by ExxonMobil.[257] To illustrate this difference, in Exhibit 9.A-B I compare the GHG Emission Proxy Cost schedules for OECD non-EU countries in the internal Dataguides to those created through the Energy Outlook process for the years 2011 through 2017.[258,259]

106. As the exhibits demonstrate, the GHG Emission Proxy Cost schedules in the Dataguides before 2014 were significantly lower and only go out to 2030 compared to 2050 in the corresponding Energy Outlook schedules. For example, the 2013 Dataguide schedule projected OECD non-EU GHG Emission Proxy Cost of $20 and $40 per ton in 2020 and

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[257] As discussed in Section VI.A.11, the GHG Emission Proxy Cost that ExxonMobil publicly disclosed in its *Outlook for Energy* and other publications was based on the GHG Emission Proxy Cost estimates it put together as part of the Energy Outlook review process.

[258] To adjust for this change in the *Outlook for Energy* naming convention, I use the data file received in relation to the 2010 *Outlook for Energy* report for the 2011 external GHG Emission Proxy Cost schedule. For the 2012-2017 GHG Emission Proxy Cost schedules, I use the data files received in relation to the *Outlook for Energy* report dated from that year.

[259] I show the OECD non-EU cost schedules as an illustrative example because the majority of the ExxonMobil financial models I reviewed are associated with ExxonMobil assets located in non-EU OECD countries. However, similar disparities between internal and publicly disclosed GHG Emission Proxy Cost schedules exist for the OECD EU and non-OECD schedules. For example, for OECD EU countries the 2013 Dataguide schedule projected GHG Emission Proxy Cost of $20 and $40 per ton in 2020 and 2030, respectively. By contrast, the 2013 Energy Outlook schedule reported GHG Emission Proxy Cost of $40 and $60 per ton in 2020 and 2030, respectively, and projected the costs to increase to $80 and $100 per ton by 2040 and 2050. Similarly, for non-OECD countries, ExxonMobil publicly disclosed GHG Emission Proxy Costs for both “leading” and “trailing” non-OECD nations (where “leading” and “trailing” refer to the likelihood of future climate change regulation) from 2011-2015, whereas the internal Dataguides for these years did not mandate the use of GHG Emission Proxy Cost for non-OECD nations. *Outlook for Energy* reports, ExxonMobil, 2011-2017; Energy Outlook Proxy Cost Bases, ExxonMobil, 2011-2017, EMC 001893315, EMC 003212721, EMC 002507099, EMC 002948182, EMC 002948186, EMC 002948185, EMC 002948164, Corporate Plan Dataguides for 2011-2017.

2030, respectively, and only projected costs out to 2030. By contrast, the 2013 Energy Outlook schedule reported OECD non-EU GHG Emission Proxy Cost of $36 and $60 per ton in 2020 and 2030, respectively, and projected the costs to increase to $80 and $100 per ton by 2040 and 2050, respectively.

107. Additionally, even after ExxonMobil purportedly aligned the GHG Emission Proxy Cost schedules used for OECD countries in the internal Dataguides with those publicly disclosed in the Energy Outlook in 2014, differences between the two schedules persisted both in the near-term and the longer-term. [260] Also, the 2015 Dataguide schedule only included projections up to 2040 while the 2015 Energy Outlook schedule went out to 2050.

108. Based on my experience analyzing and valuing oil and gas companies, the Investment Community would have likely interpreted ExxonMobil's public disclosures to mean that it was consistently applying the publicly disclosed GHG Emission Proxy Cost to its business planning and investment decision models. For instance, at ExxonMobil's 2016 Annual Shareholder Meeting, ExxonMobil's Chairman and Chief Executive Officer commented that "unlike many of our competitors, we have for many years included a price of carbon in our outlook. And that price of carbon gets put into all of our economic models when we make investment decisions as well. It's a proxy. We don't know how

[260] For instance, the 2015 Dataguide schedule projected a GHG Emission Proxy Cost of approximately $20 per ton for most OECD non-EU countries in 2020, whereas the Energy Outlook schedule reported a GHG Emission Proxy Cost of approximately $24 for those countries in 2020. The 2015 Dataguide, moreover, did not include a GHG Emission Proxy Cost for non-OECD countries, whereas the Energy Outlook schedule reported a GHG Emission Proxy Cost rising to $60 per ton for some countries by 2050. *See also,* William Colton Tr., pp. 205-206.

else to model what future policy impact might be. But whatever policies are, ultimately they come back to either your revenues or your costs. So we choose to put it in as a cost."[261] ExxonMobil's employees themselves admitted that the *Energy and Climate* and *Energy and Carbon – Managing the Risks* reports "implied that [ExxonMobil uses] the [Energy Outlook] basis for proxy cost of carbon when evaluating investments."[262]

109. Based on my experience, the Investment Community would not have interpreted such statements to mean that ExxonMobil applied a different set of cost schedules that were undisclosed to the market and, more importantly, would not have considered the two cost schedules to be different concepts as ExxonMobil contends that it did in its processes. In fact, there is evidence that even ExxonMobil's employees did not consider the two concepts to be different. For example, Robert Luettgen, ExxonMobil's Manager of the Office of the Secretary, wrote that "we [ExxonMobil] believe the correctness of our *Outlook*, including the proxy cost assumptions contained within it; so much so, that we base our investment decisions on it."[263] ExxonMobil's former GHG Managers, Guy Powell (2014–2018) and Robert Bailes (2009–2014), similarly were unable to articulate a

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261 "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2016, p. 29.

262 *See* EMC 000539921, PowerPoint presentation to Management Committee, at EMC 000539923 ("While using a lower cost basis in the CP provides a conservative view for evaluating energy conservation / emissions reduction investments, it provides an non-conservative view for evaluating capacity growth investments that involve GHG emission creation (combustion / venting / flaring etc.) […] In recent reports released by EM ("Energy and Climate" and "Energy and Carbon - Managing the risk") we have implied that we use the EO basis for proxy cost of carbon when evaluating investments.").

263 Examination of Robert Luettgen, (*Manager, Office of the Secretary, 2010-present*), December 12-13, 2017, Exhibit 2, at EMC 001198405-8406.

reason why the internal and external GHG Emission Proxy Costs should be different.[264] And even ExxonMobil's Chief Executive Officer has explicitly presented GHG Emission Proxy Costs as a single concept.[265]

110. Second, even if one were to set aside the differences in the two schedules, how ExxonMobil incorporated GHG Emission Proxy Cost in its internal models was also inconsistent. For example, ExxonMobil guided business units to include the GHG Emission Proxy Cost in the following manner before 2016:[266]

- "From 2016 to 2020, apply [the Dataguide GHG Emission Proxy Cost] to ongoing operational emissions and project economics for only those jurisdictions with existing policy/regulations."
- "From 2020 and beyond, apply [the Dataguide GHG Emission Proxy Cost] to project economics for OECD countries only."
- "For non-OECD countries, consider sensitivity case in project economics reflecting [the Dataguide GHG Emission Proxy Cost] only if future policy action reasonably anticipated in a given country."

111. Such internal guidance was again contrary to ExxonMobil's public representations. As discussed previously, ExxonMobil has publicly represented that it has consistently applied the GHG Emission Proxy Cost in its business planning and investment decisions. For example, in BlackRock's notes regarding a 2015 meeting with ExxonMobil, BlackRock noted that ExxonMobil "[i]nclude[s] a proxy cost of carbon for all [of

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[264] Guy Powell Tr., p. 267 ("I was asking him [Bailes] as to, you know, why are these things separated and what's the logic for the separation. Q And what did he tell you? A As I recall, he didn't really know.").

[265] ExxonMobil-XTO Hearing, p. 41 ("“in all of [ExxonMobil's] investment decisions […and] economic modeling, [ExxonMobil] put[s] a carbon price in [its] economic decisions and project[ed] something for the future so that [it] at least [was] considering what the effects of our investment might be in the years to come").

[266] EMC 002871205, GHG Overview Comments-2016, p. 1.

ExxonMobil's] investment decisions (varies by region)."[267] Similarly, ExxonMobil has publicly stated that "in the developing world, we apply a range of proxy costs with the more wealthy countries, like China and Mexico, reaching about $30/ton in 2040."[268]

112. Based on my experience analyzing and valuing oil and gas companies, the Investment Community would not have likely expected that ExxonMobil would instead apply the GHG Emission Proxy Cost to only those jurisdictions with existing regulations in the near term, and only OECD countries in the longer term. ExxonMobil had constructed detailed GHG Emission Proxy Cost schedules that included near-term and long-term cost projections for both OECD and non-OECD countries as part of the Energy Outlook process from at least 2011. This fact raises further questions as to why ExxonMobil did not apply those cost schedules to its business planning and investment decisions consistently.

113. Moreover, based on my professional experience, using such inconsistent assumptions across different business planning exercises and models could lead to potentially sub-optimal and inconsistent decisions. By allowing its modelers to exercise so much discretion in their corporate planning and investment modeling decisions, ExxonMobil made it very likely that some models would not account for the GHG Emission Proxy Cost appropriately. For instance, in its Kearl models, ExxonMobil included a GHG Emission Proxy Cost for only a portion of projected emissions for the asset based on

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267 BLK-EXXON-000363, October 12, 2015, company meeting notes.

268 *Energy and Climate*, ExxonMobil, March 31, 2014, p. 6.

then-existing Alberta legislation rather than its internal Dataguide or publicly disclosed cost schedules.[269] Similarly, some models, such as the 2012 Point Thomson (Point Thomson Initial Production System) model, included no GHG Emission Proxy Cost at all.[270] Additionally, in the models that I adjusted, where internal Dataguide schedules were used, the GHG Emission Proxy Cost was held constant from 2030 until the end of the projected life of the asset, while the Energy Outlook cost schedules assumed an increase of approximately 67 percent (on a real basis) between 2030 and 2050.

114. Such inconsistent modeling was again contrary to ExxonMobil's representations to the Investment Community. ExxonMobil has made clear that the GHG Emission Proxy Cost must be directly applied to individual project economics as a cost.[271] Only applying a GHG Emission Proxy Cost indirectly, through costs applied to end user energy demand that may impact the oil price assumptions used in the calculation of project economics, was inconsistent with those disclosures. There was no reason to believe that somehow the producers of crude oil and natural gas and the refiners would be exempted from incurring

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[269] *See, e.g.*, EMC 002875747, Jul. 4, 2016, "2016 Corporate Plan Dataguide - Revision 1" ("Last year, the [Corporate Plan] guidance resulted in massive GHG costs in the out years so alternate methodology was applied. I suspect something similar will be required this year."); *See also* EMC 002879540, Jul. 14, 2016, "Questions Regarding GHG Guidance in 2016 Corporate Dataguide Rev 1," ("Currently the [Kearl] model is still only following 'legislated' GHG guidance (Alberta) as part of a management decision last year . . . versus the global strat[egic] planning guidance.").

[270] EMC 004046576, Point Thomson (Point Thomson Initial Production System) Model.

[271] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters May 25, 2016, p. 29 (Rex Tillerson: "We have, unlike many of our competitors, we have for many years included a price of carbon in our outlook. And that price of carbon gets put into all of our economic models when we make investment decisions as well. It's a proxy. We don't know how else to model what future policy impacts might be. But whatever policies are, ultimately they come back to either your revenues or your cost. So we choose to put it in as a cost.").

costs resulting from GHG Emissions created during these processes.[272] In fact, ExxonMobil's management stated that "as we [ExxonMobil] look at [GHG Emissions], they have a general princip[le] that the [accountability] of those emissions should be on the actual emitter."[273]

115. Again, based on ExxonMobil's disclosures and statements and my experience analyzing and valuing oil and gas companies, the Investment Community would have likely expected ExxonMobil to apply the GHG Emission Proxy Cost to all emissions generated from a given project. It would not have expected ExxonMobil to instead only apply its GHG Emission Proxy Cost based on a fraction of the projected emissions or no GHG Emission Proxy Cost at all. As discussed previously, based on my experience and review of commentary from the Investment Community, the Investment Community was particularly concerned with the impact of GHG Emission Proxy Cost and the stranded asset risk for ExxonMobil's GHG Emission-intensive assets such as the oil sands projects.[274] By not incorporating the GHG Emission Proxy Cost for the full amount of the

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[272] *See, e.g.*, EMC 000957128, February 6, 2009 email from Tom Eizember ("ExxonMobil would be disadvantaged by an unlevel playing field among energy sources or among companies - for example, if domestic coal received favorable treatment in the name of "energy security" or if smaller oil/gas firms received favorable treatment. It is difficult to imagine a realistic unlevel playing field that would benefit ExxonMobil. One of the advantages of a GHG tax over a cap-and-trade system is that ease of application and transparency of a tax should favor broad, equitable treatment of all energy sources and companies versus cap and trade.").

[273] Guy Powell Tr., p. 467.

[274] *See* discussion *supra* Section V.C.3. *See also* A Changing Climate: The Fossil Fuel Debate," Morgan Stanley Institute for Sustainable Investing, 2016, p. 8, https://www.morganstanley.com/pub/content/dam/msdotcom/articles/fossil-fuels/A-Changing%20Climate_The%20Fossil_Fuel_Debate.pdf (oil and gas investment trends are heightening Climate Change Regulatory Risk, as producers shift to "costlier and riskier sources of energy. Already, approximately 60 [percent] of U.S. oil and gas is derived from less conventional sources such as tar sands, shale and offshore operations. As climate policy comes to force in the lead-up to 2020, the true costs of fossil fuels may increase.")

projected emissions, ExxonMobil was not consistently accounting for the impact of potential climate change regulations on the project economics of such GHG Emission-intensive assets.[275]

3. Applying Publicly-Disclosed GHG Emission Proxy Cost in Its Financial Models Significantly Impacts Projected Cash Flows of ExxonMobil's Projects

116. To illustrate the potential impact of ExxonMobil's inconsistent application of GHG Emission Proxy Cost, I reviewed a set of ExxonMobil's financial models used in its corporate planning or investment decision process and adjusted the models, where possible, to use ExxonMobil's publicly disclosed GHG Emission Proxy Cost.

117. I requested from Plaintiff all relevant corporate planning and investment decision financial models currently available in this matter. I received a total of 72 Excel spreadsheets.[276] Exhibit 10 shows the full list of these spreadsheets with the relevant information I used to identify the models for my review.

118. As shown in Table 2, out of the 72 spreadsheets made available to me, I excluded 17 spreadsheets that were files containing only inputs used in corresponding financial models (rather than the models themselves) that were not relevant to GHG Emission Proxy Cost calculations. I further excluded 10 models that were created *after* the

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275 *See* EMC 000539921, PowerPoint presentation to Management Committee, at EMC 000539923 ("While using a lower cost basis in the CP provides a conservative view for evaluating energy conservation / emissions reduction investments, it provides a non-conservative view for evaluating capacity growth investments that involve GHG emission creation (combustion / venting / flaring etc.)").

276 The count of the total number of Excel files I received excludes any impairment-related models.

announcement of Plaintiff's investigation into ExxonMobil on November 5, 2015, as ExxonMobil may have altered its modeling practices in response to the investigation.

Table 2: Waterfall of ExxonMobil Projects

		Total Count
1	Total number of files	72
2	Excluding input files	55
3	Excluding models after investigation start date (2015)[277]	45
4	Excluding models without GHG Emissions projections or costs in projected cash flows	27
5	Limiting to investment models	8

119. Of the remaining 45 models, 18 models did not include any apparent GHG emission projections or GHG Emission Proxy Cost estimates in the projected cash flows. For these models, due to a lack of projected GHG Emissions data or GHG Emission Proxy Cost estimates in the projected cash flows, I was unable to apply ExxonMobil's publicly disclosed GHG Emission Proxy Cost to the models.[278] In addition, the models for which I was able to apply the publicly disclosed GHG Emission Proxy Cost represent only a subset of the universe of ExxonMobil projects and assets. As a result, my analysis

[277] Plaintiff's investigation began in November of 2015, but I include all 2015 models, even if some of them may have been modified in 2015 after the start of the investigation. *See, e.g.*, Gillis, Justin and Clifford Krauss, "Exxon Mobil Investigated for Possible Climate Change Lies by New York Attorney General," New York Times, November 5, 2015, https://www.nytimes.com/2015/11/06/science/exxon-mobil-under-investigation-in-new-york-over-climate-statements.html.

[278] Three of the 18 models excluded at this stage, Horn River (EMC 004046559), Kearl (Debottleneck) (Advance Commitment 1) (EMC 003697670), and Baytown (Chemical Plant Metallocene Polyaolefin (MPAO)) (EMC 004276057) contain GHG Emission cost line items, but those line items do not flow through to the final cash flow figures. One other of the 18 models, Baton Rouge (Sulfur Capacity Expansion) (EMC 004046579) contains GHG Emission cost line items, but does not contain final cash flow figures.

described below likely understates the impact from ExxonMobil's inconsistent application of GHG Emission Proxy Cost in the produced models.

120. Finally, for the remaining 27 models, I made the adjustments described below.[279] The total impact on the models from these corrections is summarized in Table 3 below.

Table 3: Summary of Impact on Projected Cash Flows, NPV and IRR from Corrections[280]

	UCF ($mm USD)	NPV ($mm USD)	UCF (%)	NPV (%)	Avg. IRR (%)
Impact based on GHG Emission Proxy Cost corrections	($44,508)	($2,485)	-4.6%	-1.9%	-0.6%
Impact based on GHG Emission Proxy Cost and percentage emissions corrections	($70,249)	($4,987)	-7.2%	-3.9%	-0.6%
Impact based on GHG Emission Proxy Cost corrections (*Investment models only*)	($11,208)	($864)	-3.4%	-2.0%	-0.2%
Impact based on GHG Emission Proxy Cost and percentage emissions corrections (*Investment models only*)	($18,796)	($1,631)	-5.7%	-3.9%	-0.3%

121. First, I reviewed the models and identified the GHG Emission Proxy Cost schedules used in the model. I then updated these cost schedules with ExxonMobil's publicly disclosed

[279] In making these adjustments, I took the models as produced and only looked at the modeling case that was presented by ExxonMobil in these models. I note that there are many other assumptions in the models that affect the impact and consistency of GHG Emission Proxy Costs on the models' outputs. Some of the models, for instance, apply different inflation adjustments to GHG Emission Proxy Costs than to other cost variables. For example, in one model, EMC 003697626 (Kearl; Case 6 – Firebag Phases 1 & 2 Upper) GHG Emission Proxy Costs are only escalated by 50 percent of the consumer price index. I have not altered such assumptions for purposes of my analysis.

[280] UCF stands for the undiscounted cash flow, NPV stands for the net present value, and IRR stands for the internal rate of return. UCF is the sum of all future cash flows of a project. NPV is the sum of future cash flows discounted to their present value using a discount rate. IRR is the discount rate that would make the NPV of a given set of cash flows equal zero. *See, e.g.*, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance*, 10th ed., 2011, pp. 23-26, 108.

GHG Emission Proxy Cost schedules that were created during the Energy Outlook process carried out in the year before the date of a given model. All other input parameters in the models were left unchanged. Across all 27 models that I reviewed, this adjustment reduces the total projected UCF by $44.5 billion (i.e., 4.6 percent), NPV by $2.5 billion (i.e., 1.9] percent), and the average IRR by 0.6 percent. Exhibit 11 shows the impact of this correction for each model.

122. Second, for five models where ExxonMobil only estimated the GHG Emission Proxy Cost on a fraction of total projected GHG Emissions from the projects or assets, I applied ExxonMobil's publicly disclosed Energy Outlook GHG Emission Proxy Cost schedule to 100 percent of the projected GHG Emissions. Compared to the original models, this has the effect of reducing the total projected UCF by $70 billion (i.e., 7.2 percent), NPV by $5.0 billion (i.e., 3.9 percent), and the average IRR by 0.6 percent. Exhibit 12 shows the application of ExxonMobil's publicly disclosed GHG Emission Proxy Cost.

123. Many of the projects with the largest impact due to the application of the publicly disclosed cost are ExxonMobil's oil sands projects. For example, out of the models I reviewed, the ones with the largest impact are the models associated with the Kearl oil sands projects. I have reviewed seven Kearl projects and adjusting the GHG Emission Proxy Cost and applying these costs to 100 percent of emissions yields a $3.8 billion reduction in NPV. Another large project is Firebag, and with the applications discussed above, its NPV decreases by $220 million. The models associated with Clyden, once corrected, reduce its NPV by $131 million. The models associated with Corner, once corrected, reduce its NPV by $143 million. Finally, the models associated with Clarke Creek, once corrected, reduce its NPV by $107 million.

124. As discussed previously, ExxonMobil's oil sands projects, which account for a significant portion of its oil reserves, are GHG Emission-intensive and particularly vulnerable to climate change risk due to their low margins. Given the outsized importance of oil sands projects to ExxonMobil's business, the Investment Community has also been especially concerned that these assets could become stranded due to increased climate change regulations.[281]

125. Similar potential impact from ExxonMobil's inconsistent application of GHG Emission Proxy Cost can also be seen if only the 8 investment decision models are used.[282]First, by applying the Energy Outlook GHG Emission Proxy Cost schedule, without changing any other input parameters, reduces the total projected UCF by $11.2 billion (i.e., 3.4 percent), NPV by $0.9 billion (i.e., 2.0 percent), and the average IRR by 0.2 percent. Second, for the two of these models where ExxonMobil only estimated the GHG Emission Proxy Cost on a fraction of total projected GHG Emissions from the projects or assets, I applied ExxonMobil's publicly disclosed Energy Outlook GHG Emission Proxy Cost schedule to 100 percent of the projected GHG Emissions. Compared to the original models, this has the effect of reducing the total projected UCF by $18.8 billion (i.e., 5.7 percent), NPV by $1.6 billion (i.e., 3.9 percent), and the average IRR by 0.3 percent.

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281 *See* discussion *supra* Section V.C.3.

282 I understand that the Defendant has argued that it only ever publicly disclosed that it used GHG Emission Proxy Cost in investment decisions, but not "corporate acquisitions, its resource base, company reserves, or impairment assessments." I therefore conduct a sensitivity analysis in which I only adjust investment models which were identified as "full funding" or "advanced commitment" models by ExxonMobil. Complaint, pp. A2-A3.

Exhibits 13–14 shows the impact on each model within this subset by applying the publicly disclosed cost.

126. Thus, as demonstrated by these analyses, applying the Energy Outlook GHG Emission Proxy Cost to ExxonMobil's business planning and investment decision models reduces the projected cash flows and returns for ExxonMobil's assets. Thus, by not applying its publicly disclosed GHG Emission Proxy Cost consistently in its project economics, ExxonMobil inflated the outlook for its business.[283] The members of ExxonMobil's Management Committee ("MC Members"), including its Chairman, were provided company business plans and potential capital investments that served as the basis of their knowledge of the operational and financial plans of the company.[284] MC Members were also presented projections from the Energy Outlook process.[285] Given the inconsistencies regarding ExxonMobil's treatment of GHG Emissions Proxy Costs, the information in these materials was likely overstated.

127. The MC Members, moreover, in addition to the Corporate Secretary, were the primary ExxonMobil employees who spoke with equity research analysts.[286] In the MC Members' discussions with equity analysts, they relayed certain operational and financial guidance

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283 Applying the publicly disclosed GHG Emission Proxy Costs to 100 percent of emissions would have increased operating expenses and reduced the projected profitability for some large projects. Deposition of Dan Hoy, (*Imperial Oil Project Manager, 2005-2018, Imperial Oil North America Production Projects Centre of Excellence Supervisor, 2018-present*), April 25, 2019, p. 123 ("A. If -- if the price in the dataguide was applied to 100 percent of emissions, that would increase Opex. Q. MR. WALLACE: And what impact would increasing Opex have on earnings? A. It would reduce earnings.").

284 *See, e.g.,* Deposition of Thomas Eizember, (*ExxonMobil Corporate Planning Manager, 2004-2014*), April 17, 2019, pp. 26-27. *See also* Mark Shores Tr. pp. 48-49.

285 Todd Onderdonk Tr., pp. 88-89 and 492.

286 Mark Shores Tr. p. 30.

regarding the future performance of the company.[287] In addition, data from these materials were included in ExxonMobil's Analyst Meeting presentations, which were widely attended by equity analysts.[288] Thus, the inflated outlook presented in ExxonMobil's corporate planning and investment modeling would likely have been conveyed to the Investment Community through the MC Members.

128. In addition, as a consequence of ExxonMobil's representations regarding its use of GHG Emission Proxy Cost, the Investment Community would have likely based its assessment of the company's future operational and financial attributes, in part, on the fact that ExxonMobil was accounting for Climate Change Regulatory Risk through its use of GHG Emission Proxy Costs. As discussed above, this would be particularly important for assets such as oil sands that already had low-margins and were GHG Emissions intensive. For such assets, the Investment Community likely received a false sense of security by ExxonMobil's representation that GHG Emission Proxy Costs were being incorporated into the project economics, and therefore may have unknowingly taken on additional risk with respect to the assets becoming uneconomic or stranded if GHG Emission Proxy Costs were added to existing operating costs.

129. The exclusion of GHG Emission Proxy Costs and the inflated company outlook, therefore, would have likely positively biased Investment Community's assessments and valuations of ExxonMobil. Based on my experience analyzing and valuing oil and gas

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287 WFS000001-WFS000024, email from Colleen Hansen (Wells Fargo) re: "Reminder – Exxon Mobil HQ Meeting Next Thursday, May 26," at WFS000022.

288 *See, e.g.,* "Transcript of Exxon Mobil Analyst Meeting," Thomson Reuters, March 6, 2013, p. 9. *See* also ExxonMobil Analyst Meeting presentation, March 2, 2016, p. 19; ExxonMobil Analyst Meeting presentation, March 1, 2017, p. 57.

companies, had ExxonMobil consistently accounted for GHG Emission Proxy Cost as it publicly represented, reductions in the returns from its assets, in particular, the oil sands projects, would have likely had a negative impact on Investment Community's assessment and valuation of ExxonMobil.

VII. ESTIMATE OF AGGREGATE DAMAGES TO EXXONMOBIL SHAREHOLDERS

130. I have been asked by counsel to calculate the potential number of ExxonMobil shares that were negatively impacted and provide an estimate of the potential aggregate damages suffered by ExxonMobil's shareholders resulting from the disclosures of the company's alleged misrepresentations regarding its adoption of GHG Emissions Proxy Cost.[289]

131. To conduct this analysis, I have reviewed and analyzed publicly available institutional investor shareholding data for ExxonMobil shareholders for the purposes of quantifying the potential number of shares impacted by the disclosures of ExxonMobil's alleged misrepresentations.[290] The results from this analysis are then applied to the inflation per

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[289] I offer no opinion regarding the proper categorization of the legal relief to which the NYAG is entitled (*e.g.*, damages or restitution).

[290] Institutional investor shareholding data have been used by academics to analyze trading activity. *See, e.g.,* Brunnermeier, Markus and Stefan Nagel, "Hedge Funds and the Technology Bubble," *The Journal of Finance,* Vol. LIX, No. 5, October 2004, pp. 2013-2040. Based on my professional experience, I am also aware of these data being used by business professional for similar purposes. In some contexts, a claims adjudication process can be used to calculate aggregate damages suffered by those shareholders who purchased stock at an inflated prices (as estimated by an events study). In these contexts, the need to estimate aggregate damages is mitigated by the existence of individual claimants who can verify the date and size of their purchase of the affected stock. However, I understand in the current matter this individualized data (embodied in individual claims) is not available. To the extent additional data become available, I reserve the right to update my estimates.

share to provide an estimate of the potential aggregate damages suffered by ExxonMobil's shareholders.[291]

132. Per-share damages in this matter can be calculated as the inflation per share at the time of purchase less the inflation at the time of sale (or the inflation at the time of purchase if the share was not ultimately sold as of the end of the "Inflation Period" as defined below).[292] Specifically, if the share was sold before the start of the Inflation Period on April 1, 2014, then there are no damages.[293] However, if the security was purchased during the Inflation Period and sold after the inflation on ExxonMobil's stock price had dissipated, then per-share damages would be equal to the inflation per share at the time of purchase minus the inflation per share at the time of sale. For example, assume that a given investor purchased a share between April 1, 2014, and January 19, 2016 at a price that was inflated by $4.25 per share. If the investor later sold the share between January 20, 2016 and September 19, 2016 at a price that was inflated by $2.61, then the per-share loss to the investor is equal to $1.64, which is equal to $4.25 minus $2.61.

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[291] Specifically, Professor Eli Bartov estimates the reduction in the inflation per share on ExxonMobil's stock price due to corrective disclosures regarding ExxonMobil's alleged misrepresentation using an econometric model. *See* Bartov Report, ¶16 and Section V.

[292] This methodology is referred to as the "out-of-pocket" method. Gold, Kevin L., Eric Korman and Ahmer Nabi, "Federal Securities Acts and Areas of Expert Analysis," *Litigation Services Handbook, The Role of the Financial Expert*, 6th ed., Ed. Roman L. Weil, Daniel G. Lentz, and Elizabeth A. Evans, John Wiley & Sons, Inc., 2017, Ch. 27, pp. 12-17.

[293] Professor Bartov used April 1, 2014, as the start of the Inflation Period when ExxonMobil's stock price was inflated due to alleged misrepresentation. ExxonMobil released the *Energy and Carbon - Managing the Risks* and the *Energy and Climate* reports on March 31, 2014, which included the most significant disclosure from ExxonMobil regarding its exposure to climate change regulations and management of those risks through its use of GHG Emission Proxy Costs. The end of the Inflation Period is the last date that Professor Bartov found the stock price to be inflated in his model. *See* Bartov Report, Section V.D.

A. Estimation of Institutional Purchases and Sales in the Inflation Period

133. In the following section, I describe the methodology used to estimate the number of shares purchased at inflated prices for a given period. For purposes of this analysis, I rely on and take as given the period set forth in the event study analysis performed by Professor Eli Bartov.[294] The period during which Professor Bartov's analysis finds ExxonMobil's stock price to be inflated (*i.e.,* the "Inflation Period") and the corresponding estimate of price inflation on a per-share basis during the period are shown in Table 4 below.[295] I report two sets of results: (1) when the three significant event dates (January 20, 2016, September 20, 2016, and June 2, 2017) in Professor Bartov's analysis are used, and (2) when only the January 20, 2016 event date is used.[296]

Table 4 - Professor Bartov's Estimated Inflation Per Share

Inflation Period	**Estimated Impact Per Share**
Using Three Significant Event Dates in Bartov Report	
April 1, 2014 to January 19, 2016	$4.25
January 20, 2016 to September 19, 2016	$2.61
September 20, 2016 to June 1, 2017	$1.16
Using One Significant Event Date in Bartov Report	
April 1, 2014 to January 19, 2016	$1.64

294 *See* Bartov Report, ¶16 and Section V.D.

295 *See* Bartov Report, ¶16 and Section V.D.

296 Professor Bartov found three significant event dates at the 90% confidence interval and one event date at 95% confidence level. *See* Bartov Report, ¶16 and Section V.D.

134. To estimate the number of shares purchased by investors during the Inflation Period, I analyze the quarter-end shareholdings of ExxonMobil's stock by institutional shareholders as reported by Thomson One. These data are based on institutional shareholders' SEC Form 13F filings. The total amount of shares held by institutional ExxonMobil shareholders at the end of each quarter from April 1, 2014, to June 2, 2017 is shown in Exhibit 15.

135. Using quarter-end shareholdings for each institutional shareholder, I then estimate the net number of shares that were either bought or sold during the quarter by the institutional shareholder. If the shareholdings at the end of a quarter declined relative to the shareholdings of the preceding quarter, I take the amount of the decline to reflect that in net, the shareholder sold shares in the latter quarter. Similarly, if the shareholdings at the end of a quarter increased relative to the shareholdings of the preceding quarter, I take the amount of the increase to reflect that in net, the shareholder bought shares in the latter quarter.

136. Then, I estimate the number of "Impacted Shares" (*i.e.,* those shares bought during the Inflation Period and then sold within the Inflation Period or sold or held after the end of the Inflation Period). To estimate the number of Impacted Shares for each individual institutional ExxonMobil investor whose 13F data are available, I use the last-in-first-out ("LIFO") method to match the shares assumed to be sold during a given quarter within the Inflation Period (as well as the shares assumed to be retained at the end of the Inflation Period) to the shares assumed to be purchased during previous quarters. Under the LIFO method, each sale of ExxonMobil stock during the Inflation Period is matched

to the shares purchased in previous quarters, starting with the most recent quarter.[297] Table 5 below shows the total number of Impacted Shares during the Inflation Period as a percentage of average number of outstanding shares during the period, using the LIFO method.

Table 5 - Estimated Number of Impacted Shares and Number of Shares Outstanding

Inflation Period	Impacted Shares	Average Shares Outstanding[298]	Impacted Shares as Percentage of Average Shares Outstanding
April 1, 2014 to January 19, 2016	290,203,705	4,255,994,704	6.8%
January 20, 2016 to September 19, 2016	130,370,872	4,187,203,601	3.1%
September 20, 2016 to June 1, 2017	205,629,572	4,194,926,025	4.9%

B. Estimation of Aggregate Damages to ExxonMobil's Shareholders

137. I estimate the potential aggregate damages to ExxonMobil's shareholders using the estimated number of Impacted Shares and the estimated inflation on a per-share basis. Given that quarterly shareholding data is publicly available for certain of ExxonMobil's institutional investors only, my approach here does not necessarily cover all institutional investors who owned ExxonMobil's stock during the Inflation Period and certainly does not cover Impacted Shares bought by non-institutional investors. Additionally, as I use the quarterly institutional shareholding data, my analysis also does not take into account any intra-quarter changes in shareholdings or trading within a given individual institution. As a result, my estimate of potential aggregate damages likely understates the total

297 The LIFO matching methodology is illustrated in further detail with an example in Appendix C.

298 Average shares outstanding includes average short interest and is net of average insider holdings for each period. Average shares outstanding is calculated by averaging daily shares outstanding data from Bloomberg. Average short interest is calculated by averaging bi-weekly shares outstanding data from Bloomberg. Insider holdings are calculated by averaging quarterly insider holding data from Thomson One.

damages suffered by all ExxonMobil shareholders due to ExxonMobil's alleged misrepresentations and therefore is conservative.

138. For the Impacted Shares, as discussed previously, damages per share are considered to be the difference between the estimated inflation per share at the time of purchase and the estimated inflation per share at the time of sale or, if held after the Inflation Period, zero. For each institutional investor, I sum the losses calculated for the Impacted Shares to estimate its total damages. Summing together the estimated total damages across the institutional investors for which data was available provides an estimate of aggregate damages.

139. Table 6 below shows the estimated damages to ExxonMobil's shareholders. Based on the inflation per share obtained from Professor Bartov's regression model, I estimate aggregate damages resulting from the disclosures on the three statistically significant event dates (January 20, 2016, September 20, 2016, and June 2, 2017) to be $1.60 billion.[299] If I were to use the even more conservative estimated inflation per share for the single event date of January 20, 2016 as reported in the Bartov Report, the estimated aggregated damages to institutional shareholders would be $476 million.

[299] I also considered first-in-first-out ("FIFO") and the weighted average shares ("Weighted Average") method to match shares sold in the Inflation Period. Under the FIFO method, each sale of ExxonMobil stock during the Inflation Period is first matched to the shares purchased before the start of the Inflation Period. Then, once the shares purchased before the Inflation Period have been exhausted for matching, each sale is matched to the shares purchased during each quarter in the Inflation Period starting with the first quarter in the Inflation Period. Under the Weighted Average method the shares sold in the Inflation Period are matched on a pro-rata basis to all the shares purchased prior to each share sold being considered. Conservatively, in the report I present the results from LIFO method which yields the lowest estimate of potential aggregate damages. I show the damage estimates based on all three matching methodologies in Appendix D.

Table 6 - Estimated Aggregate Damages to Institutional Shareholders

Inflation Period	**Total Damages From Impacted Shares (millions)**[300]
Using Three Significant Event Dates in Bartov Report	
April 1, 2014 to January 19, 2016	$1,090
January 20, 2016 to September 19, 2016	$275
September 20, 2016 to June 1, 2017	$239
Total Potential Aggregate Damages	**$1,603**
Using One Significant Event Date in Bartov Report	
April 1, 2014 to January 19, 2016	$476
Total Potential Aggregate Damages	**$476**

Peter Boukouzis

Peter M. Boukouzis

May 8, 2019

[300] Damages in each Inflation Period are based on shares purchased during that period. These shares are then sold in a later period or held through the post-Inflation Period.

APPENDIX A

PETER (PETE) M. BOUKOUZIS
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+1 917-817-0455 (mobile); boukouzis@hotmail.com

EDUCATION

University of Chicago Booth School of Business — Chicago, IL
Masters of Business Administration (MBA) — March 1998
Concentrations in Accounting, Economics, and Finance

University of Illinois — Urbana/Champaign, IL
Bachelors of Science (B.S.) in Chemical Engineering — May 1990

EMPLOYMENT

Self-Employed — Carlsbad, CA
Independent Consultant — 2018–present
Consult on a variety of strategic matters, including valuation, mergers and acquisitions, business strategy, capital raising, business development, and business plan counseling
Serve as an expert witness regarding oil and gas matters on teams representing plaintiffs and defendants

University of Saint Katherine — San Marcos, CA
Business Department Chair and Assistant Professor of Business — 2018–present
Liberal arts undergraduate university founded in 2010; received accreditation from WSCUC in 2016
Current enrollment of approximately 200 students; over 40% are business majors
Academic advisor to all business majors
Manage staff of approximately ten adjunct professors
Teach a number of courses, including finance, accounting, management, and capstone
Actively involved in recruiting prospective students

BMO Capital Markets (Bank of Montreal) — Houston, TX
Managing Director and Head of U.S. Energy Mergers and Acquisitions (M&A)
2009–2016
Led BMO's U.S. Energy M&A practice; responsible for pipeline and storage, exploration and production, utilities, coal (MLP), refining, oilfield services, and gasoline transportation and retail sectors; accountable for $10+ million budget; retired from BMO in 2016
Served as a Member of the Investment Banking Fairness Committee
Responsible for origination and execution of M&A mandates worldwide
Led and managed up to 25 investment bankers on multiple, simultaneous projects

- Member of the senior investment banking team responsible for the hiring and training of mid- and junior-level investment bankers; led investment banker recruiting efforts in many of the top undergraduate universities and MBA schools in the United States
- Directed the preparation of detailed historical financial statements and future financial projections, including capital expenditures and working capital, for use in selling memoranda and valuation calculations
- Prepared board materials and led discussions with corporate boards of directors to propose, vet, and execute transaction projects
- Developed strategies and tactics to increase the probability of achieving successful transactions
- Executed both domestic and cross-border transactions with corporate (private, public, and government-owned) around the world and private equity clients; also deeply involved in the financings of transactions
- Collaborated with other groups within the bank (energy coverage group, debt capital markets, equity capital markets, country offices) to provide clients with a comprehensive investment banking solution

Rothschild, Inc. — New York, NY
Director, Merger & Acquisitions Group — 2001–2009

- Worked on and executed a range of M&A and advisory assignments in the natural resources, healthcare, media, industrials, and other sectors
- Executed both domestic and cross-border transactions
- Collaborated with colleagues worldwide to provide clients high-quality advisory services
- Additional 18-month role as staffer; staffed and managed 25 junior bankers

Broadmark Capital Corporation — Seattle, WA
Director – Private Placements — 2000–2001

- Responsible for origination and execution of financings for early-stage technology and telecommunication companies

UBS — New York, NY
Associate Director, Oil and Gas Group and Generalist Group — 1998–2000

- Responsible for day-to-day management and execution of M&A transactions and equity and debt financings

Clark Refining and Marketing — Blue Island, IL
Refinery Process Engineer — 1995–1997

Pacific Refining Company — Hercules, CA
Refinery Process Engineer — 1993–1995

Conoco, Inc. — Ponca City, OK/Billings, MT
Process Design Engineer — 1990–1993

SELECTED TRANSACTION EXPERIENCE (closed)

BMO Capital Markets

Selected transactions include:

- ArcLight Capital's acquisition of Gulf Oil (pipeline and infrastructure)
- PKN ORLEN's (Poland) acquisition of FX Energy (upstream oil and gas)
- Alpha Coal's acquisition of EDF's (France) interest in Pennsylvania Land Resources Holding Company (upstream oil and gas)
- Gaz Metro's (Canada) acquisition of Central Vermont Public Service (utilities)
- Westmoreland Resource Partners LP's acquisition of Kemmerer Mine from Westmorland Coal Company (coal)
- ArcLight Capital's acquisition of PPC (pipeline and infrastructure)
- Oil India's (India) formation of a joint venture (30% interest) with Carrizo Oil and Gas regarding its Niobrara assets (upstream oil and gas)
- Westmoreland Coal Company's acquisition of the General Partner of Oxford Resource Partners and contribution of royalty-bearing coal reserves to Oxford Resource Partners, LP (coal)
- Mid-Atlantic Convenience Stores's (owned by Catterton) sale to Sunoco/ETP (gasoline transportation and retail)
- AltaGas's (Canada) acquisition of SEMCO Holding Corporation (owned by Bessemer) (utilities)
- ArcLight Capital's acquisition of a 50% interest in Eureka Pipeline (pipeline and infrastructure)
- Linn Energy's acquisitions of Hugoton and Jonah assets from BP (upstream oil and gas)
- Concho Resources's acquisition of Three Rivers (upstream oil and gas)
- Cerberus Capital's acquisition of a majority interest in Keane Energy (services)
- Magnum Hunter's acquisitions of NuLoch Resources Canada and NGAS Resources (upstream oil and gas)
- Atinum's (South Korea) formation of a joint venture (50% interest) with Gastar Resources regarding its Marcellus assets (upstream oil and gas)
- KKR's acquisition of Samson Resources (upstream oil and gas; pipeline)

Rothschild Inc.

Selected transactions include:

- Advice regarding structuring of Trident Resources Corporation's (Canada) "rescue" financing (upstream oil and gas)
- Sterling Energy plc's (U.K.) acquisition of Whittier Energy Corporation (upstream oil and gas)
- Advice to New York-based hedge fund regarding its investment in a large cap US exploration and production company (upstream oil and gas)
- Compagnie Generale de Geophysique's (France) acquisition of Veritas DGC Inc. (oilfield services)
- SloanLED's majority sale to Harbour Group (industrial products)
- Thermo Electron Corporation's merger with Fisher Scientific International (healthcare)

- Kelso & Company's acquisition of Hallmark Entertainment LLC from Hallmark Cards, Inc. (media)
- Sale of Ultraframe plc (including Four Season Sunrooms; U.K.) to Latium Holdings Limited (consumer products)
- Sale of AMVEST Oil & Gas and AMVEST Corporation to Constellation Energy Partners LLC and CONSOL Energy, respectively (upstream oil and gas; coal)
- Valuation of Royal Dutch/Shell's South African refining business (downstream)
- Thermo Electron's acquisition of Kendro Laboratory Products from SPX Corporation (healthcare)

Broadmark Capital Corporation

Selected transactions include:

- Series A funding for gigabit Ethernet company
- Series A funding for VoDSL telecom company

UBS

Selected transactions include:

- Sale of BP's AC20 refined products pipeline to Colonial Pipeline Company (pipeline and infrastructure)
- Sale of BP's Alliance refinery to Tosco Corporation (refining)
- Secondary stock offering for Laser Vision Centers Inc. (healthcare)
- Advisory to Petroleos de Venezuela S.A. (PdVSA; Venezuela) regarding its Ruhr Oel GmbH joint venture in Germany (refining)

OTHER NOTABLE MANDATED ASSIGNMENTS

Selected assignments include:

Delivered fairness opinions and valuations to multiple North American corporations regarding transaction or proposed transactions

North American pipeline company's all-stock offer for Williams Companies (pipeline and infrastructure)

US E&P company's unsolicited all-stock offer for Arena Resources (upstream oil and gas)

US pipeline company's unsolicited stock-and-cash offer for SemGroup Corp and Rose Rock Midstream, its controlled MLP (pipeline and infrastructure)

Proposed sale of Magnum Hunter's majority interest in the Eureka Hunter pipeline (pipeline and infrastructure)

China National Offshore Oil Corporation's unsolicited public cash offer for Unocal Corporation (upstream oil and gas)

Potential all-stock sale of public pipeline MLP (pipeline and infrastructure)

COURSES TAUGHT AT THE UNIVERSITY OF SAINT KATHERINE

Corporate Finance (Textbook: Ross, S., Westerfield, R., & Jordan, B. Principles of Corporate Finance)
Financial Accounting (Textbook: Phillips, F., Libby, R., & Libby, P. Fundamentals of Financial Accounting)
Managerial Accounting (Textbook: Brewer, P., Garrison, R., & Noreen, E. Introduction to Managerial Accounting)
Foundations of Management (Textbook: Williams, D. MGMT: Principles of Management)
Senior Capstone (Textbook: Shelton, H. The Secrets to Writing a Successful Business Plan)

APPENDIX B

MATERIALS CONSIDERED

Legal Documents

Expert Report of Eli Bartov, People of the State of New York v. Exxon Mobil Corporation, Index No. 452044/2018, May 8, 2019.

Exxon Mobil Corporation's Brief in Opposition to the New York Attorney General's Motion to Compel, People of the State of New York v. Exxon Mobil Corporation, Index No. 451962/2016, July 9, 2018.

Exxon Mobil Corporation’s Responses and Objections to the Attorney General’s Interrogatories, People of the State of New York v. Exxon Mobil Corporation, Index No. 451962/2016, October 1, 2018.

Exxon Mobil Corporation’s Responses and Objections to the Attorney General’s Contention Interrogatories, People of the State of New York v. Exxon Mobil Corporation, Index No. 452044/2018, May 1, 2019.

People of the State of New York v. Exxon Mobil Corporation, Index No. 452044/2018, October 24, 2018.

Depositions and Associated Exhibits

Examination of Jason Iwanika, September 7 - 8, 2018.

Examination of Todd Onderdonk, November 7-8, 2017.

Examination of Mark Shores, December 7-8, 2017.

Examination of Robert Luettgen, December 12-13, 2017.

Examination of Kirsten Bannister, February 14-15, 2018.

Examination of Peter Trelenberg, July 20, 2017.

Examination of Guy Powell, July 27, 2017.

Examination of Norma Fisk, January 31 - February 1, 2018.

Examination of Richard Ducharme, April 2, 2019.

Examination of Thomas Richard Eizember, April 17, 2019.

Deposition of Dan Hoy, April 25, 2019.

Deposition of Brant Edwards, April 30, 2019.

Examination of Robert Bailes, July 19-20, 2017.

Examination of William Colton, June 27-28, 2017.

Bates Stamped and Other Produced Documents

BLK-EXXON-000363

BOA-NYAG-Exxon-000002199

Corporate Plan Dataguides and Appendices for 2011-2017.

EMC 000371210

EMC 000387651

EMC 000510874

EMC 000525249

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EMC 000538036

EMC 000539921

EMC 000957128

EMC 001403266

EMC 001594743

EMC 001596274

EMC 001598610

EMC 001604454

EMC 001608351

EMC 001613011

EMC 001621806

EMC 001764946

EMC 001893315

EMC 002402347

EMC 002507099

EMC 002532516

EMC 002632510

EMC 002855106

EMC 002871205

EMC 002875747

EMC 002879540

EMC 002948164

EMC 002948182

EMC 002948185

EMC 002948186

EMC 003000676

EMC 003030969

EMC 003175912

EMC 003203566

EMC 003212719

EMC 003212721

EMC 003262194

EMC 003317583

EMC 003327864

EMC 003680301

EMC 003697671

EMC 003739418

EMC 003739513

PNYAG0155640

PNYAG0245665

PNYAG0590859

SSC_NYAG_0001948

VGI0938

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VGI1920

WFS000001

Letter from Justin Anderson to Kevin Wallace, Re: People of the State of New York v. Exxon Mobil Corporation, Index No. 452044/2018, April 12, 2019.

Letter from Nora Ahmed to John Oleske and Katherine Milgram, Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation, July 9, 2018.

Letter from Nora Ahmed to Jonathan Zweig and Manisha Sheth, October 12, 2018.

Letter from Nora Ahmed to Manisha Sheth and Jonathan Zweig, Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation, September 28, 2018.

Letter from SEC to ExxonMobil, Mar. 17, 2014.

Financial Models

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EMC 003150586

EMC 003697497

EMC 003697563

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EMC 003697674

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EMC 003973954

EMC 003976219

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EMC 004046579

EMC 004046580

EMC 004322515

EMC 004322516

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Analyst and ISS Reports

"Special Report: Climate Change: Preparing for the Long Term," Credit Week, S&P, May 28, 2014.

"Renewables, TCFD and Shareholder Proposals," Morgan Stanley Research.

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"Chevron Annual Voting Results and ISS Recommendation," ISS, May 25, 2016.

"Exxon Mobil Corp.," ISS Report, May 10, 2012.

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Glover, Phineas and Sheridan Duffy, "ESG Eye: Market Forces vs Trump," Macquarie, June 6, 2017.

Herbert Bill, et al., "Macro-Energy," Simmons & Company, September 23, 2016.

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Herrlin, John and Joshua Sheppard, "ExxonMobil: 4Q15 and 2015 Results: In-Line with SGe, Higher Volumes, Lower Tax Rate," Société Générale, February 2, 2016.

Herrlin, John and Mark Kogel, "ExxonMobil: $2.8bn for 21.25 Net Tcf of Gas Resources ($0.13/Mcfe); No LNG Development Costs or Plans Discussed," Société Générale, March 9, 2017.

Herrlin, John and Mark Kogel, "ExxonMobil: 1Q17 Reported EPS: $0.95 Reflects Higher Pricing, Cost Control, and Facility Up Time," Société Générale, April 28, 2017.

Herrlin, John and Mark Kogel, "ExxonMobil: 2Q16 EPS Basically Flat with 1Q16, but Cash Flow + 10%. Canadian Fires, Lower R&M, and Forex Offset Higher Upstream Pricing," Société Générale, July 29, 2016.

Herrlin, John and Mark Kogel, "ExxonMobil: 3 for 4 with Rank DeepH20 Wildcatting in Guyana is Impressive, but Not Much Market Reaction," Société Générale, March 30, 2017.

Herrlin, John and Mark Kogel, "ExxonMobil: 3Q16 EPS Better than Street Consensus Given Sales Gain; Lower Cap-Ex and Better QOQ EPS," Société Générale, October 28, 2016.

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APPENDIX C

Illustrative Example of LIFO Matching Methodology

1. Below I provide a brief illustrative example of LIFO methodology I use to match the share sales in the Inflation Period to prior purchases.

2. To begin, assume that the Inflation Period includes the second, third and fourth quarter of 2014. Based on the changes in the number of shares held by a given institutional investor at the end of each quarter net purchases (increase in shareholding) and net sales (decrease in shareholdings) for each quarter can be estimated.

	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015
Quarter End Shareholding for Investor A	160,000,000	162,500,000	162,650,000	162,000,000	161,500,000
Purchases & Sales	160,000,000	2,500,000	150,000	-650,000	-500,000

3. In this illustrative example, I apply the LIFO methodology in the following manner:

First, I begin by matching the sale of 650,000 shares during the fourth quarter of 2014 to the most recent purchase prior to this sale in the third quarter of 2014. As 150,000 shares were purchased in the third quarter, after matching, there would be 500,000 shares sold in the fourth quarter of 2014 that remain unmatched.

	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015
Quarter End Shareholding for Investor A	160,000,000	162,500,000	162,650,000	162,000,000	162,000,000
Purchases & Sales	160,000,000	2,500,000	150,000	-650,000	0
LIFO - Step 1	160,000,000	2,500,000	0	-500,000	0

Next, I take the remaining unmatched sold shares and match it to the next most recent purchase, which in this case would be 2,500,000 shares purchased during the second quarter of 2014. After the matching process, this would leave 2,000,000 shares that were purchased during the inflation period that were not sold.

	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015
Quarter End Shareholding for Investor A	160,000,000	162,500,000	162,650,000	162,000,000	162,000,000
Purchases & Sales	160,000,000	2,500,000	150,000	-650,000	0
LIFO - Step 1	160,000,000	2,500,000	0	-500,000	0
LIFO - Step 2	160,000,000	2,000,000	0	0	0

4. As a result, using the LIFO methodology, for Investor A the remaining 2,000,000 shares that were purchased during the Inflation Period would be considered as Impacted Shares.

APPENDIX D

Estimated Aggregate Damages to Institutional Shareholders

Inflation Period	Estimated Impact Per Share	Damages From Impacted Shares (millions) LIFO	Weighted Average	FIFO
Using Three Significant Event Dates in Bartov Report				
April 1, 2014 to January 19, 2016	$4.25	$1,090	$1,533	$1,747
January 20, 2016 to September 19, 2016	$2.61	$275	$364	$407
September 20, 2016 to June 1, 2017	$1.16	$239	$286	$305
Total Potential Aggregate Damages		$1,603	$2,182	$2,459
Using One Significant Event Date in Bartov Report				
April 1, 2014 to January 19, 2016	$1.64	$476	$658	$740
Total Potential Aggregate Damages		$476	$658	$740

Notes:

[1] Damages in each Inflation Period are based on shares purchased during that period. These shares are then sold in a later period or held through the post-Inflation Period.

Sources:

[1] Thompson One.

[2] Bartov Report.

Exhibit 1
CDP – Climate Change Aggregate & Performance Scores

Year	ExxonMobil	Chevron	Shell	BP	Eni	Total	Lukoil
2018	F	F	C	F	A-	A-	D
2017	C	B	B	A-	A-	A-	D
2016	C	B	A-	B	A	B	D
2015	C	B	B	B	B	C	Not Scored
2014	C	A-	B	B	B	C	Not Scored
2013	B	A-	B	C	B	C	NA
2012	C	B	B	C	A	B	NA
2011	B	B	A-	B	B	B	NA
2010	C	B	A	B	A	B	Not Scored

Notes:
[1] CDP scores from 2016 onward aggregate scores of the level of detail and comprehensiveness of companies' CDP disclosures, awareness of climate change issues, management methods, and progress towards action taken on climate change as reported in responses to CDP.
[2] From 2016 onward, an F indicates failure to provide sufficient information to the CDP to be evaluated. Disclosure, awareness, management, and leadership are evaluated cumulatively (with letter grades D, C, B, and A corresponding to those characteristics, respectively). In order to be evaluated on a given characteristic, the company must score sufficiently well on the characteristic corresponding to the tier directly below.
[3] Prior to 2016, a performance score of A indicates integration of climate-related priorities into business strategy, good climate change management and stakeholder communications, and substantive action to reduce emissions. A performance score of B indicates a recognition of the importance of climate change risk management, but limited provision of information in certain key performance areas, which limits CDP's ability to conduct a thorough evaluation. A performance score of C indicates some climate change action, and a performance score of D indicates that a company recognizes the importance of participating in the CDP, but has disclosed limited evidence of actions taken on mitigation or adaption.
[4] CDP scores given 2015 and earlier are not directly comparable with CDP scores given 2016 and later.
[5] BP, Chevron, and ExxonMobil received F grades in 2018 because they did not respond to the CDP's 2018 climate change questionnaire. The CDP "encourage[s] investors to raise this lack of transparency in discussions with company management."
[6] Lukoil declined to participate in the CDP climate change response in 2013, and did not respond in 2011 and 2012.

Sources:
[1] CDP, CDP.net.
[2] "CDP Climate Change Report 2016: United Kingdom Edition, Carbon Disclosure Project," CDP, October 2016.
[3] "Carbon Disclosure Project 2010: Global 500 Report," CDP, 2010.
[4] "European Oil Majors Spending Up to 7% on Low Carbon but Wider Industry Needs to Step Up," CDP, November 12, 2018, https://www.cdp.net/en/articles/investor/european-oil-majors-spending-up-to-7-on-low-carbon-but-wider-industry-needs-to-step-up.

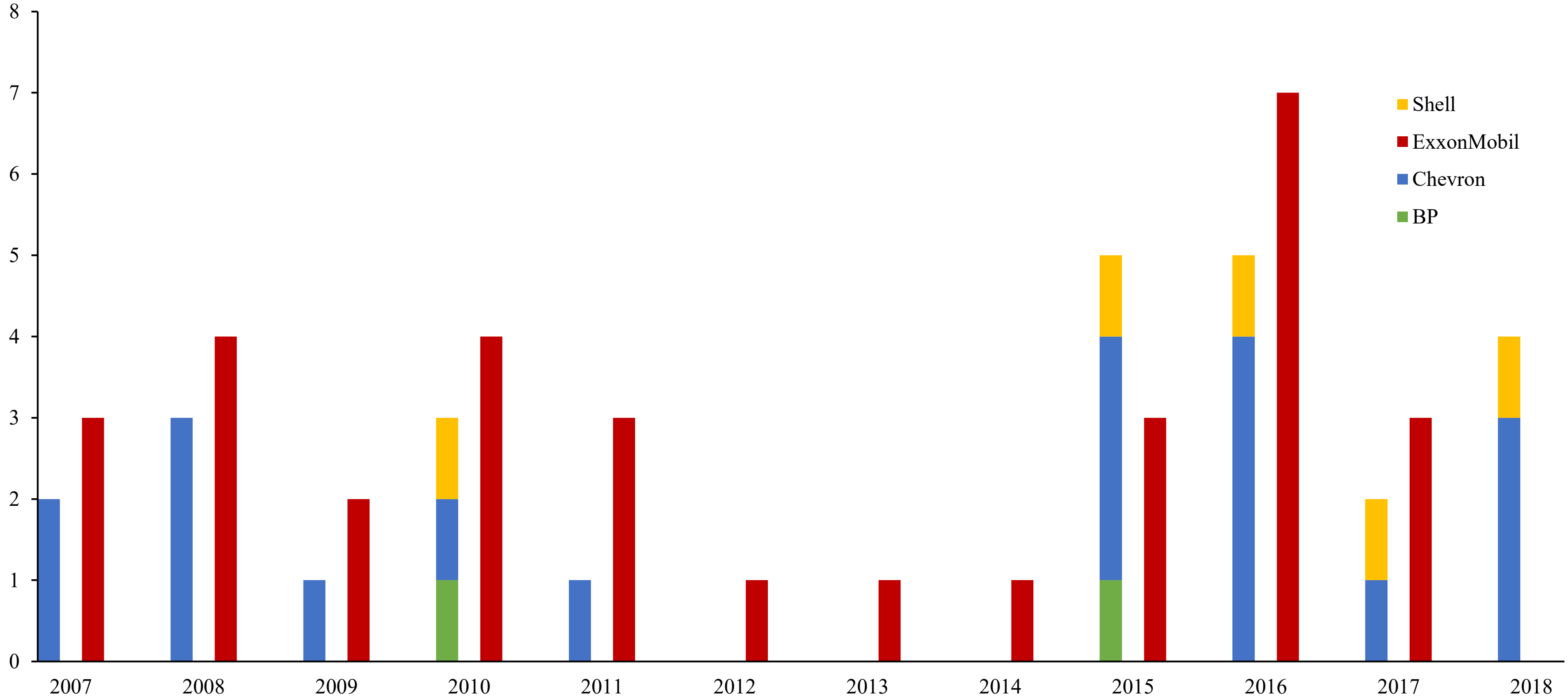
Exhibit 2
Oil and Gas Company Proxy Costs for GHG Emissions Disclosed to CDP (per ton prices)

Year	ExxonMobil	Chevron	Shell	BP	Eni	Total	Lukoil
2018	NA	NA	**$40** (sensitivity may exceed **$100**)	NA	**$40**	**$30** to **$40** or actual (long term costs)	No proxy cost for GHG Emission
2017	Notes use of GHG Emission Proxy Cost in Energy Outlook and investment process	Regional, economic, and policy basis	**$40** (with sensitivity analysis)	**$40**, **$80** stress test (industrialized countries)	**€40** (uniform cost)	**$30** to **$40** or actual (long term costs), historically **€25**	No proxy cost for GHG Emission
2016	Approaches **$80** by 2040 in some geographies (included in Outlook)	Regional, economic, and policy basis	**$40** (with sensitivity analysis)	**$40** (industrialized countries)	Set to main markets scenario, **$40** for sensitivity analysis	**$30** to **$40** or actual (long term costs), historic **€25**	NA
2015	Approaches **$80** by 2040 in some geographies (included in Outlook)	Regional, economic, and policy basis	**$40**	**$40** (industrialized countries)	Set to main markets scenario, **$40** for sensitivity analysis	**€25** (medium term base case)	NA
2014	Approaches **$80** in some areas (embedded in Outlook)	Regional, economic, and policy basis	**$40**	**$40** (industrialized countries)	Based on Euro Emissions Trading and Kyoto framework	**€25** (medium term base case)	NA
2013	About **$80** by 2040 (For purposes of Outlook)	Law, policy and regulation basis	**$40**	**$40** (industrialized countries)	Based on Euro Emissions Trading and Kyoto framework	**€25** (medium term base case)	NA
2012	**$60** by 2030 (for purpose of Outlook)	Law, policy and regulation basis	**$40**	**$40** (industrialized countries)	Based on Euro Emissions Trading and Kyoto framework	**€25** (medium term sensitivity)	NA
2011	**$30** by 2020, **$60** in 2030 (in OECD countries, for purpose of outlook)	Law, policy and regulation basis	**$40**	**$40** (material emissions projects in industrialized countries)	Based on Euro Emissions Trading and Kyoto framework	**€ 25**	NA
2010	Describes Climate Change Regulatory Risks, but not how they're internally accounted.	Law, policy and regulation basis	**$40**	**$40** (material emissions projects in industrialized countries)	Based on Euro Emissions Trading and Kyoto framework	**€ 25**	No information reported

Notes:
[1] ExxonMobil reports in 'metric tons' from 2010-2013 and 'tons' from 2014-2016; Shell reports in 'tonnes' for all years; BP reports in 'tonnes' for all years; Eni reports in 'tonnes' for 2017 and 2018, units in other years ambiguous; Total reports in 'tonnes' for all years.
[2] If no numerical proxy cost for GHG Emission is listed for a given year, the company did not disclose a numerical proxy cost for GHG Emission figure to CDP that year.
[3] Disclosures were not available for ExxonMobil, Chevron, and BP for 2018.

Source:
[1] Company responses to the CDP's Climate Change Module from Shell, BP, Eni, Chevron, Total, Lukoil, and ExxonMobil, 2010-2018 (where available).

Exhibit 3
Number of Shareholder Proposals Voted Upon Concerning Climate Change Regulatory Risk per Year
2007-2018



Notes:
[1] This chart accounts for all Chevron, ExxonMobil, Shell, and BP shareholder proposals voted upon from 2007-2018 that express investor concern about Climate Change Regulatory Risk.
[2] Shareholder resolution filings are relatively scarce in Europe compared to the US due to higher disclosure among European Companies, high ownership requirements, and a cultural tendency to prefer engagement as a way to instigate change among European investors.

Sources:
[1] Chevron, Forms DEF 14A, 2007-2018.
[2] ExxonMobil, Forms DEF 14A, 2007-2018.
[3] "Notice of Annual General Meeting," Shell, 2007-2018.
[4] "Notices of BP Annual General Meeting," BP, 2007-2018.
[5] Horster, Maximilian and Kosmas Papadopoulos, "Climate Change and Proxy Voting in the U.S. and Europe," Harvard Law School Forum on Corporate Governance and Financial Regulation, January 7, 2019, https://corpgov.law.harvard.edu/2019/01/07/climate-change-and-proxy-voting-in-the-u-s-and-europe/.

Exhibit 4.A
Shell: Shareholder Resolutions
Related to Climate Change Regulatory Risk (2007–18)

Resolution Subject	Resolution	Year	Outcome	Vote Share	Board Stance	ISS Stance
Canadian Oil Sands	A request for the Board to prepare a report discussing the long-term economic, legal, and reputational risks to the Company from its investments in the oil sands.	2010	Defeated	5.4%	Against	Against
Strategic Resilience for 2035 and Beyond	A request that the 2016 annual report includes further information about Shell's approach to handling the risks and opportunities of climate change.	2015	Passed	98.9%	For	For
Renewables Transition	A request that Shell prepare a strategy within the year to become a renewable energy company by investing the profits from fossil fuels in renewables.	2016	Defeated	2.8%	Against	Against
Targets for GHG Emissions Reductions	A request for Shell to set targets for greenhouse gas emissions reductions that are aligned with the Paris Agreement goal of limiting global warming to well below 2°C.	2017 2018	Defeated Defeated	6.3% 5.5%	Against Against	Against Against

Notes:
[1] This table contains all resolutions voted upon from 2007–18 that express investor concern about Climate Change Regulatory Risk.
[2] There were no resolutions in 2007–09 or 2011–14 expressing investor concern about Climate Change Regulatory Risk.
[3] Vote shares are calculated using the numbers of votes "For" divided by the total number of all votes "For" and "Against" (excluding abstentions).
[4] In 2019, the shareholder resolution on Targets for GHG Emissions Reductions also appears in the Notice of Annual General Meeting. The board again recommends that shareholders vote against this resolution.

Sources:
[1] "Notice of Annual General Meeting," Shell, 2007–2019.
[2] ISS Voting Analytics.
[3] Stewart, Nyree, "11% of Shareholders Revolt over Shell Tar Sands Resolution," Investments & Pensions Europe, May 19, 2010, https://www.ipe.com/news/11-of-shareholders-revolt-over-shell-tar-sands-resolution/35417.fullarticle.

Exhibit 4.B
BP: Shareholder Resolutions
Related to Climate Change Regulatory Risk (2007–18)

Resolution Subject	Resolution	Year	Outcome	Vote Share	Board Stance	ISS Stance
Sunrise Oil Sands Project	A request to circulate a report setting out the assumptions made by the company in deciding to proceed with the Sunrise Project (oil sands) regarding future carbon prices, oil price volatility, demand for oil, anticipated regulation of greenhouse gas emissions and legal and reputational risks arising from local environmental damage and impairment of traditional livelihoods.	2010	Defeated	6.2%	Against	Against
Strategic Resilience for 2035 and Beyond	A request, given the recognized risks and opportunities associated with climate change, for annual reporting from 2016 of ongoing operational emissions management; asset portfolio resilience to the IEA's scenarios; low-carbon energy R&D and investment strategies; relevant strategic key performance indicators and executive incentives; and public policy relating to climate change.	2015	Passed	98.3%	For	For

Notes:
[1] This table contains all resolutions voted upon from 2007–18 that express investor concern about Climate Change Regulatory Risk.
[2] There were no resolutions in 2007–09, 2011–14, or 2016-2018 expressing investor concern about Climate Change Regulatory Risk.
[3] Vote shares are calculated using the numbers of votes "For" divided by the total number of all votes "For" and "Against" (excluding abstentions).
[4] BP's 2019 Notice of Meeting included a resolution requesting additional transparency on how BP's capital expenditures account for a future consistent with the Paris Agreement's climate goals, and the development and reporting on clear metrics related to product carbon intensity. The board supports this resolution. BP's 2019 Notice of Meeting also included a resolution that BP align its targets with the Paris Climate Agreement, and to invest accordingly in the energy transition to a net-zero-emission energy system. The board does not support this resolution.

Sources:
[1] "Notice of BP Annual General Meeting," BP, 2007–2019.
[2] ISS Voting Analytics.
[3] "2010 AGM Poll Results," BP, 2010 https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/investors/bp-agm-poll-results-2010.pdf.

Exhibit 4.C
Chevron: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title[2]	Resolution	Year	Outcome	Vote Share	ISS Stance
Stockholder Proposal on the Proposal to Report on Host Country Environmental Laws/ Stockholder Proposal Regarding Report on Host Country Laws	A request that the board report on the policies and procedures that guide Chevron's assessment of host country regulations with respect to their adequacy to protect human health, the environment, and Chevron's reputation.	2007 2008 2009	Defeated Defeated Defeated	8.6% 8.3% 8.8%	Against Against Against
Stockholder Proposal Regarding Targets for Reducing Greenhouse Gas Emissions/ Stockholder Proposal Regarding Greenhouse Gas Emissions/ Proposal to Report on Greenhouse Gas Emissions	A request that the Board adopt long-term, quantitative, company-wide targets for reducing GHG emissions in products and operations (for the 2015 & 2016 proposals, considering the global commitment to limit warming to 2 degrees C, the 2007 proposal stipulates a target of 'below 1990 levels'), and issue a report on its plans to achieve that target.	2007 2008 2015[4] 2016	Defeated Defeated Defeated Defeated	8.5% 10.4% 8.2% 7.9%	Against Against Against Against
Stockholder Proposal Regarding Reporting on Environmental Impact of Oil Sands Operations in Canadian Boreal Forest	A request that a board committee report on the environmental damage that would result from Chevron's expanding oil sands operations in the Canadian boreal forest. The report should consider the implications of a policy of discontinuing these expansions.	2008	Defeated	28.6%	For
Stockholder Proposal Regarding Financial Risks From Climate Change	A request that the board prepare a report on the financial risks from climate change and their impacts on shareowner value over time, and actions the board deems necessary to protect business interests and value. Recommended issues to include in analysis: emissions management, physical risks for business and operations, US and global regulatory risks, 'material risks', reputation/ brand/ legal risks, water scarcity, and positive brand opportunities.	2010 2011	Defeated Defeated	8.6% 7.3%	Against Against

Exhibit 4.C
Chevron: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title[2]	Resolution	Year	Outcome	Vote Share	ISS Stance
Stockholder Proposal Regarding Proxy Access Right[5]	A request for the Board to include a "proxy access" bylaw to allow qualifying shareholders to submit nominations for director positions.	2015	Passed	55.3%	For
Stockholder Proposal Regarding Dividend Policy	A request that Chevron commit to increasing the amount authorized for capital distributions to shareholders as a prudent use of investor capital in light of the climate change related risks of stranded carbon assets.	2015 2016	Defeated Defeated	3.2% 3.5%	Against Against
Stockholder Proposal Regarding Report on Reserve Replacements	A request that in its CSR report, Chevron annually quantify and report its reserve replacements in BTUs by resource category to assist Chevron in responding to climate-changed induced market changes.	2016	Defeated	6.8%	Against
Stockholder Proposal Regarding Report on Climate Change Impact Assessment	A request that Chevron, with board oversight, publish an annual assessment of long-term (to 2035) portfolio impacts of climate change policies, including how capital planning and business strategies incorporate analyses of the short and long term financial risks of a lower carbon economy, and outlining impacts of different demand and price scenarios (including the 2 degrees C scenario) for Chevron's existing reserves and resource portfolio.	2016	Defeated	40.8%	For

Exhibit 4.C
Chevron: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

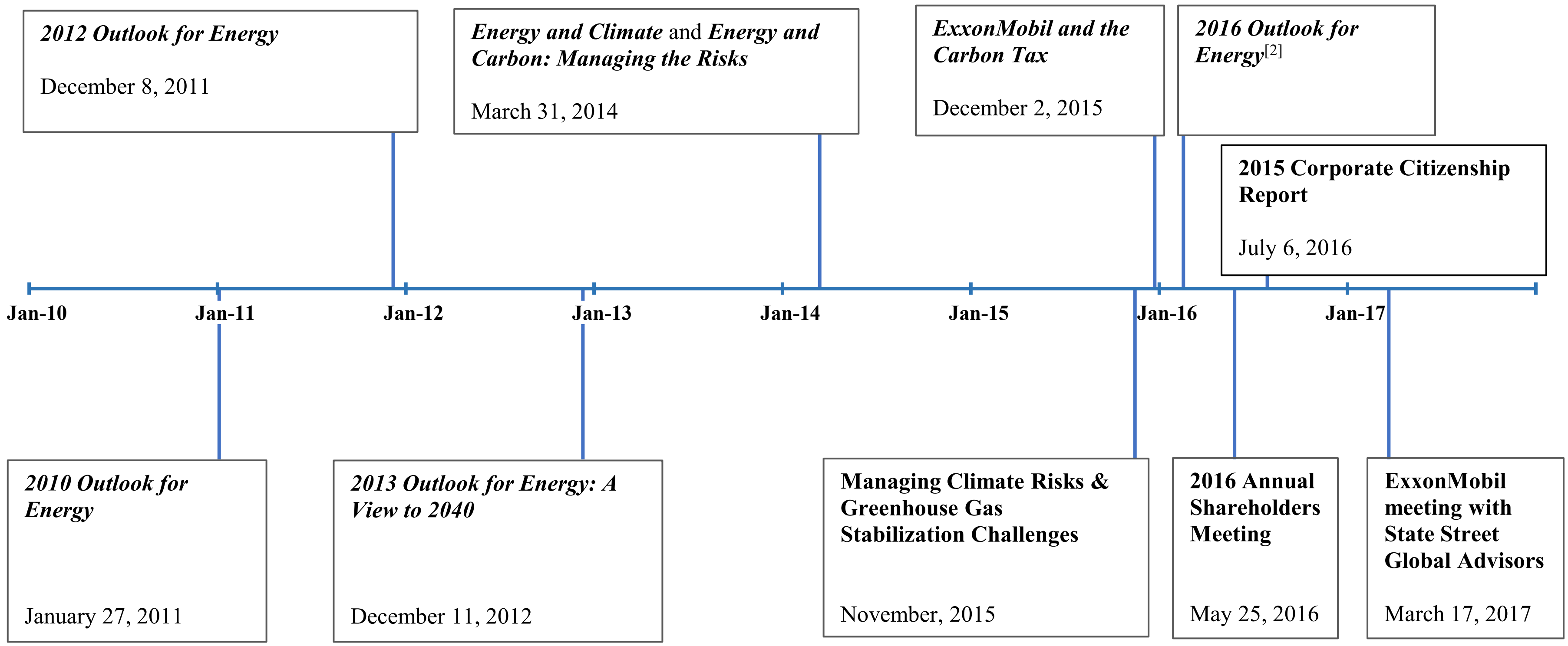
Proposal Title[2]	Resolution	Year	Outcome	Vote Share	ISS Stance
Stockholder Proposal Regarding Report on Transition to a Low Carbon Economy	A request that Chevron issue a report assessing how it can respond to climate change and the resultant transition to a low carbon economy, by evaluating the feasibility of altering the Chevron's energy mix, selling off highest carbon-risk assets, and acquiring companies with outstanding assets in low carbon or renewable energy.	2017	Defeated	26.0%	For
Stockholder Proposal Regarding Report on Transition to a Low Carbon Business Model	A request for the board to oversee the issue of a report describing how Chevron could adapt its business model to align with a decarbonizing economy by altering its energy mix to reduce fossil fuel dependence, in order to reduce societal GHG emissions and protect shareholder value.	2018	Defeated	8.1%	Against
Stockholder Proposal Regarding Report on Methane Emissions	A request that Chevron provide a report using quantitative indicators on the company's actions beyond regulatory requirements to minimize methane emissions from hydraulic fracturing operations	2018	Defeated	45.0%	For
Stockholder Proposal Regarding Independent Chairman[6]	A request that the Board of Directors adopt a policy to require the Chair of the Board of Directors to be an independent member of the board.	2018	Defeated	24.0%	Against

Exhibit 4.C
Chevron: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Notes:
[1] This table contains all proposals voted upon from 2007–18 that express investor concern about Climate Change Regulatory risk. Proposals listed on Chevron's DEF 14A filings that were withdrawn prior to voting are not included.
[2] Titles are as they appear in the Chevron DEF 14A filings.
[3] Vote shares are calculated using the numbers of votes "For" divided by the total number of all votes "For" and "Against" (excluding abstentions).
[4] In 2009, a similar shareholder proposal was withdrawn by the same primary proponent, after the proponent acknowledged Chevron's progress in tracking carbon at the time.
[5] An identically worded proxy access bylaw proposal was linked to climate change regulatory risk by the same proponents at the 2015 ExxonMobil annual shareholder meeting. They stated that "ExxonMobil received this proposal due to its exposure to risk related to climate change." See Thomson Reuters, Transcript of ExxonMobil Corporation Shareholders Meeting, May 27, 2015, p. 17. The New York City Comptroller, which votes the proponents' proxies, released a paper on the proposal, which was introduced at 75 Companies, in which both ExxonMobil and Chevron governance focus areas are listed as "Fossil Fuel."
[6] In 2018 and 2019, this proposal regarding an independent chairman was linked to climate change, noting that Chevron faces increased "climate-related tort claims and similar litigation," and that climate change is a "massive risk that is already manifesting and set to intensify in the long run via regulation." In 2017, 2015, 2014, 2012, 2008, and 2007, proposals regarding separating the CEO and chairman positions were also raised.
[7] In 2019 Chevron received 3 proposals related to climate change regulatory risk: a stockholder proposal regarding a report on reducing Chevron's carbon footprint, a stockholder proposal regarding a board committee on climate change, and a stockholder proposal regarding an independent chairman.
[8] There were no proposals in 2012, 2013, or 2014 expressing investor concern about Climate Change Regulatory Risk.

Sources:
[1] Chevron, Forms DEF 14A, 2007-2019.
[2] ISS Voting Analytics.
[3] ClimateBiz Staff, "Shareholders Convince Chevron to Track Product Carbon Content," GreenBiz, May 27, 2009, https://www.greenbiz.com/article/shareholders-convince-chevron-track-product-carbon-content.
[4] Transcript of ExxonMobil Corporation Shareholders Meeting, Thomson Reuters, May 27, 2015, p. 17.
[5] "Shareholder Initiatives of the New York City Pension Fund," New York City Pension Funds, 2015, https://comptroller.nyc.gov/wp-content/uploads/documents/2015_Shareowner_Initiatives_Postseason_Report.pdf.

Exhibit 5.A
Key ExxonMobil GHG Emission Proxy Cost Disclosures
2010-2017



Notes:
[1] This timeline presents select key disclosures of Exxon's GHG Emission Proxy Costs between 2010 and 2017.
[2] Exact date of publication could not be determined based on available materials from ExxonMobil.
Sources:
[1] *The Outlook for Energy: A View to 2030*, Exxon, 2010.
[2] *The Outlook for Energy: A View to 2040*, Exxon, 2012, 2013, 2016.
[3] *Energy and Climate*, Exxon, March 31, 2014.
[4] *Energy and Carbon - Managing the Risks*, Exxon, March 31, 2014.
[5] Trelenberg, Peter W., "Managing Climate Risks and Greenhouse Gas Stabilization Challenges," November 2015. (PNYAG0245665)
[6] Gardner, Rob, "The Outlook for Energy: A view to 2040" Exxon presentation to the International Energy Forum, February, 2016.
[7] Summary of meeting between State Street and Exxon (Woodbury, Trelenberg, and Luettgen), March 17, 2017. (SSC_NYAG_0001948)

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
2010 *Outlook for Energy*	"ExxonMobil anticipates that, by 2020, adoption of these policies will be equivalent to adding CO_2 costs of about $30 per ton in the OECD. At this level, natural gas becomes a lower-cost source of electricity than coal, while nuclear and wind become increasingly competitive. This shift becomes even more pronounced if CO_2 costs rise to $60 per ton, which is where we anticipate policies in the OECD will drive costs by 2030." (p. 29)	January 27, 2011
2012 *Outlook for Energy*	"But with a cost of CO_2 – either direct or indirect – at $60 per ton (what ExxonMobil expects to see in OECD countries by 2030), coal would be more expensive than natural gas, nuclear and wind power." (p. 29) "Integral to these forecasts is an expectation that governments will set policies that will impose a cost on CO_2 emissions [...] ExxonMobil sees OECD CO_2 costs reaching about $80/ton by 2040. Non OECD countries also will begin adding CO_2 costs around 2030. By 2040, we see China reaching $30/ton and many other Non OECD nations approaching $20/ton." (p. 30)	December 8, 2011
CDP Response 2011	"For the purposes of the Outlook, ExxonMobil anticipates that by 2020, adoption of these policies will be equivalent to adding CO_2 costs of about $30 per metric ton in OECD countries, rising to $60 per metric ton by 2030."	2011
2013 *Outlook for Energy*	Map of the world shows GHG Emission Proxy Costs of "More than $40 per ton" in OECD countries, "$20-$40 per ton" in leading non-OECD countries, and "Less than $20 per ton" in trailing non-OECD countries. (p. 34) "ExxonMobil expects the implied cost of CO_2 emissions to reach about $80 per ton in 2040. OECD nations will continue to lead the way in adopting these policies, with developing nations gradually following, led by China." (p. 34)	December 11, 2012
CDP Response 2012	"The Outlook for Energy: A View to 2040, our long-term forecast of supply and demand trends, projects global energy demand in 2040 to be about 30% higher than it was in 2010—even with substantial gains in efficiency. Meeting this rising demand for energy to support economic growth and prosperity, while minimizing environmental impact, is ExxonMobil's mission and is a key dual challenge facing governments and societies worldwide. The scale and nature of this challenge is described in the Outlook, which we use to help guide our investment decisions. We also share it publicly to encourage broader understanding of energy issues. For the purposes of the Outlook, ExxonMobil anticipates that by 2020, adoption of climate change policies will be equivalent to adding CO_2 costs of about $60 per metric ton by 2030."	2012

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
2014 *Outlook for Energy*	Chart of Average U.S. cost of electricity generation in 2030 by fuel source builds in a "$60/Tonne of CO_2" sensitivity analysis. (p. 31) "To help model the potential impacts of a broad mosaic of future GHG policies, we use a simple cost of carbon as a proxy mechanism. For example, in most OECD nations, we assume an implied cost of CO_2 emissions that will reach about $80 per tonne in 2040. OECD nations are likely to continue to lead the way in adopting these policies, with developing nations gradually following, led by China." (p.32)	December 12, 2013
CDP Response 2013	"The Outlook for Energy: A View to 2040, our long-term forecast of supply and demand trends, projects global energy demand in 2040 to be about 35% higher than it was in 2010—even with substantial gains in efficiency. Meeting this rising demand for energy to support economic growth and prosperity, while minimizing environmental impact, is ExxonMobil's mission and is a key dual challenge facing governments and societies worldwide. The scale and nature of this challenge is described in the Outlook, which we use to help guide our investment decisions. We also share it publicly to encourage broader understanding of energy issues. For the purposes of the Outlook, ExxonMobil anticipates that adoption of climate change policies will be equivalent to adding CO_2 costs of about $80 per metric ton by 2040. OECD countries will continue to lead the way in adopting these policies, with developing nations gradually following, led by China."	2013
Corporate Citizenship Report: 2013	"To help model the potential impacts of a broad mosaic of future GHG policies, we use a simple cost of carbon as a proxy mechanism. For example, in most OECD nations, we assume an implied cost of CO_2 emissions that will reach about $80 per metric ton in 2040. OECD nations are likely to continue to lead the way in adopting these policies, with developing nations gradually following, led by China." (p. 54)	May 28, 2014

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
Energy and Climate	"Future policies related to limiting GHG emissions remain uncertain and likely will vary over time and from country to country. However, for our Outlook we use a cost of carbon as a proxy to model a wide variety of potential policies that might be adopted by governments to help stem GHG emissions. For example, in the OECD nations, we apply a range of proxy costs with the more wealthy countries, like China and Mexico, reaching about $30/ton in 2040 [...]This GHG proxy cost is integral to ExxonMobil's planning[...]" (pp. 5-6) "The company employs a robust process for evaluating investment opportunities and managing our portfolio of operating assets. ExxonMobil requires that all business units use a consistent corporate planning basis, including the proxy cost of carbon discussed above, in evaluating capital expenditures and developing business plans." (p. 20) Map of the world shows GHG Emission Proxy Costs of "More than $40 per ton" in OECD countries, "$20-$40 per ton" in leading non-OECD countries, and "Less than $20 per ton" in trailing non-OECD countries. (p. 6)	March 31, 2014

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
Energy and Carbon - Managing the Risks	Map of the world shows GHG Emission Proxy Costs of "More than $40 per ton" in OECD countries, "$20-$40 per ton" in leading non-OECD countries, and "Less than $20 per ton" in trailing non-OECD countries. (p. 17) "We also address the potential for future climate-related controls, including the potential for restriction on emissions, through the use of a proxy cost of carbon. This proxy cost of carbon is embedded in our current *Outlook for Energy* , and has been a feature of the report for several years. The proxy cost seeks to reflect all types of actions and policies that governments may take over the Outlook period relating to the exploration, development, production, transportation or use of carbon-based fuels. Our proxy cost, which in some areas may approach $80/ton over the Outlook period, is not a suggestion that governments should apply specific taxes. It is also not the same as a "social cost of carbon," which we believe involves countless more assumptions and subjective speculation on future climate impacts. It is simply our effort to quantify what we believe government policies over the Outlook period could cost to our investment opportunities. Perhaps most importantly, we require that all our business segments include, where appropriate, GHG costs in their economics when seeking funding for capital investments." (pp. 17-18) "We also require that all significant proposed projects include a cost of carbon – which reflects our best assessment of costs associated with potential GHG regulations over the Outlook period – when being evaluated for investment." (p. 21)	March 31, 2014
CDP Response 2014	"ExxonMobil addresses the potential for future climate-related controls, including the potential for restriction on emissions, through the use of a proxy cost of carbon. This proxy cost of carbon is embedded in our current Outlook for Energy, and has been a feature of the report for several years. The proxy cost seeks to reflect all types of actions and policies that governments may take over the Outlook period relating to the exploration, development, production, transportation or use of carbon-based fuels. Our proxy cost, which in some areas may approach $80/ton over our Outlook period, is our effort to quantify what we believe government policies could cost to our investment opportunities. Perhaps most importantly, we require that all our business segments include, where appropriate, GHG costs in their economics when seeking funding for capital investments. We require that investment proposals reflect the climate-related policy decisions we anticipate governments making during the Outlook period and therefore incorporate them as a factor in our specific investment decisions."	2014
More on Divestment	"We fully expect governments to take various actions to constrain carbon emissions in coming years. Our increased investment in cleaner-burning natural gas has been guided in part by this assumption. ExxonMobil's Outlook for Energy assumes a proxy cost of carbon of $80 per ton, significantly above the current average worldwide."	November 6, 2014
Managing Climate Risks & Greenhouse Gas Stabilization Challenges	Chart entitled "Energy-related CO_2 Emissions Peak by 2030" show GHG Emission Proxy Costs of ~$30/ tonne by 2020 in the OECD, ~$60/ tonne by 2030 in the OECD, $80/ tonne by 2040 in the OECD, and between ~$5/ tonne and ~$35 in the non-OECD by 2040.	November 2015
ExxonMobil and the Carbon Tax	"One key point we make in many of these briefings is that ExxonMobil has included a proxy price on carbon in our business planning since 2007. This enables us to analyze the impact of a price on carbon on various investment opportunities. This proxy cost, which in some regions may approach $80 per ton, seeks to reflect all types of actions and policies that governments may take."	December 2, 2015

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
CDP Response 2015	"We update our long-term energy outlook each year — taking into account the most up-to-date demographic, economic and technological information available. This analysis serves as a foundation for our long-term business strategies and investments. We address the potential for future climate change policy, including the potential for restrictions on emissions, by estimating a proxy cost of carbon. This cost, which in some geographies may approach $80 per ton by 2040, has been included in our Outlook for several years. This approach seeks to reflect potential policies governments may employ related to the exploration, development, production, transportation or use of carbon-based fuels. We believe our view on the potential for future policy action is realistic and, by no means represents a "business as usual" case. We require all of our business lines to include, where appropriate, an estimate of GHG-related emissions costs in their economics when seeking funding for capital investments."	2015
Meeting Global Needs - Managing Climate Change Business Risk	"We use a simple cost of carbon as a proxy mechanism to help model the potential impacts of a broad mosaic of future GHG policies. For example, in most OECD nations, we assume an implied cost of CO_2 emissions that will reach about $80 per metric ton in 2040. Developing nations will have a wide range of policy costs with the wealthiest ones reaching about $35 per metric ton. This GHG proxy cost is integral to ExxonMobil's planning [...]"	2016 or earlier
2016 *Outlook for Energy*	"For purposes of *The Outlook* , we continue to assume that governments will enact policies that impose rising costs on energy-related CO_2 emissions, reaching an implied cost in OECD nations of about $80 per tonne in 2040. China and other leading non-OECD nations are expected to trail OECD policy initiatives." (p. 49)	Early 2016 or late 2015[2]
The Outlook for Energy: A View to 2040 (presentation by Rob Gardner to the International Energy Forum)	Map of the world shows GHG Emission Proxy Costs of "2040 CO_2 'Proxy' Cost" of "~80 $/ton" in OECD countries, "<10 $/ton" "~20 $/ton" in some non-OECD countries, "~35 $/ton" in Mexico, China, and Turkey, and "< 10 $/ton" in trailing non-OECD countries.	Presented to the International Energy Forum in February 2016
2016 Proxy statement	"The Company addresses the potential for future climate-related policy, including the potential for restriction on emissions, through the use of a proxy cost of carbon. The proxy cost seeks to reasonably reflect the types of actions and policies that governments may take over the outlook period relating to the exploration, development, production, transportation or use of carbon-based fuels. This proxy cost of carbon is embedded in our Outlook for Energy, and has been a feature of the report since 2007. All business segments are required to include, where appropriate, an estimate of the costs associated with greenhouse gas emissions in their economics when seeking funding for capital investments." (p. 66)	April 13, 2016

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date
2016 Annual Shareholders Meeting	"We have, unlike many of our competitors, we have for many years included a price of carbon in our outlook. And that price of carbon gets put into all of our economic models when we make investment decisions as well. It's a proxy. We don't know how else to model what future policy impacts might be. But whatever policies are, ultimately they come back to either your revenues or your cost. So we choose to put it in as a cost. So we have accommodated that uncertainty in the future, and everything gets tested against it." (p. 29)	May 25, 2016
2015 Corporate Citizenship Report	"The *Outlook* forms the foundation for the company's business strategies and helps guide our investment decisions [...] ExxonMobil addresses the potential for future climate change policy, including the potential for restrictions on emissions, by estimating a proxy cost of carbon. This cost, which in some geographies may approach $80 per ton by 2040, has been included in our Outlook for several years." (p. 38)	July 6, 2016
Q2 2016 ExxonMobil Earnings Call	"[I]f you look in our energy outlook, which we've got posted on our Company website, you'll see that we've included for -- now for many years a, what we call a proxy cost of carbon. And over the outlook period out to 2040, that number grows to as high as $80 per ton. But you'll see it in our energy outlook, if you go a head and take a look at it." (p. 25, Quote from Jeff Woodbury, VP of IR and Secretary)	July 29, 2016
CDP Response 2016	"ExxonMobil's long-range annual forecast, The Outlook for Energy, examines energy supply and demand trends for approximately 100 countries, 15 demand sectors and 20 different energy types. The Outlook forms the foundation for the company's business strategies and helps guide our investment decisions. In response to projected increases in global fuel and electricity demand, our 2016 Outlook estimates that global energy-related CO_2 emissions will peak around 2030 and then begin to decline. A host of trends contribute to this downturn — including slowing population growth, maturing economies and a shift to cleaner fuels like natural gas and renewables — some voluntary and some the result of policy. ExxonMobil addresses the potential for future climate change policy, including the potential for restrictions on emissions, by estimating a proxy cost of carbon. This cost, which in some geographies may approach $80 per ton by 2040, has been included in our Outlook for several years. This approach seeks to reflect potential policies governments may employ related to the exploration, development, production, transportation or use of carbon-based fuels. We believe our view on the potential for future policy action is realistic and by no means represents a "business-as-usual" case. We require all of our business lines to include, where appropriate, an estimate of greenhouse gas-related emissions costs in their economics when seeking funding for capital investments."	2016
ExxonMobil meeting with State Street Global Advisors	ExxonMobil representatives note that a GHG Emission Proxy Cost has been used since 2007, set at $5 for least developed countries and between $20-$80 for OECD countries, for example.	March 17, 2017

Exhibit 5.B
Detailed Selection of ExxonMobil's GHG Emission Proxy Cost Disclosures
2010-2017

Document	Quote	Date

Notes:
[1] Disclosures of GHG Emission Proxy Costs from ExxonMobil publications, presentations, questionnaire responses, and meetings.
[2] Date range for this publication based on the date the *Outlook for Energy* was published in prior and following years.

Sources:
[1] *2010-2016 Outlook for Energy* (no report was titled with 2011 due to changes in the Outlook's naming convention, 2015 report was not considered, 2017 report does not appear to mention GHG Emission Proxy Cost projections).
[2] ExxonMobil Responses to CDP's Climate Change Module, 2010-2016.
[3] "Corporate Citizenship Report," ExxonMobil 2013 and 2015.
[4] *Energy and Climate* , ExxonMobil, March 31, 2014.
[5] *Energy and Carbon - Managing the Risks* , ExxonMobil, March 31, 2014.
[6] Cohen, Ken, "More on Divestment: A letter to Tim Writh," ExxonMobil. Posted November 6, 2014.
[7] PNYAG0245665, Trelenberg, Peter W., "Managing Climate Risks and Greenhouse Gas Stabilization Challenges," ExxonMobil November 2015.
[8] Cohen, Ken, "ExxonMobil and the Carbon Tax," ExxonMobil EnergyFactor, Posted December 2, 2015.
[9] "Meeting Global Needs - Managing Climate Change Business Risk," ExxonMobil, published 2016 or earlier.
[10] "Notice of 2016 Annual Meeting and Proxy Statement," ExxonMobil, April 13, 2016.
[11] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 25, 2016.
[12] "XOM - Q2 2016 Exxon Mobil Corp Earnings Call," Thomson Reuters, July 29, 2016.
[13] SSC_NYAG_0001948, 3/17/2017 Summary of meeting between State Street and ExxonMobil (Woodbury, Trelenberg, and Luettgen), March 17, 2017.

Exhibit 6
ExxonMobil: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title	Resolution	Year	Outcome	Vote Share	ISS Stance
Board Chairman and CEO[3][4]	A request for the Board to amend the bylaws to appoint an independent director as Board Chairman and bar the company CEO from serving concurrently as Board Chairman.	2007	Defeated	40.0%	For
		2008	Defeated	39.5%	For
		2016	Defeated	38.7%	For
Renewable Energy Investment Levels	A request for the Board to adopt a policy to boost global investment in the renewables sector.	2007	Defeated	7.3%	Against
		2008	Defeated	27.5%	For
		2009	Defeated	27.3%	For
Greenhouse Gas Emissions Goals	A request for the Board to adopt quantitative goals for reducing GHG Emissions and report to shareholders on its plans to achieving those goals.	2007	Defeated	31.1%	For
		2008	Defeated	30.9%	For
		2009	Defeated	29.0%	For
		2010	Defeated	27.2%	For
		2011	Defeated	26.5%	For
		2012	Defeated	27.1%	For
		2013	Defeated	26.7%	For
		2014	Defeated	22.0%	For
		2015	Defeated	9.6%	Against
Planning Assumptions	A request for the Board to issue a report on the risk that fossil fuel demand drops significantly below ExxonMobil projections in the next 20 years, and on the impacts of such a drop for strategic planning.	2010	Defeated	7.8%	Against
Canadian Oil Sands	A request for the Board to prepare a report discussing the long-term environmental, social, and economic risks to the Company from its investments in the oil sands.	2010	Defeated	9.1%	For
		2011	Defeated	27.1%	For
Report on Energy Technology	A request for the Board to prepare a report on how ExxonMobil can become an environmentally sustainable energy company.	2008	Defeated	9.4%	Against
		2010	Defeated	6.7%	Against
		2011	Defeated	6.1%	Against

Exhibit 6
ExxonMobil: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title	Resolution	Year	Outcome	Vote Share	ISS Stance
Climate Expert on Board	A request for the Board to nominate at least one candidate with strong environmental experience to become an independent director (as serving members' terms expire).	2015 2016	Defeated Defeated	21.0% 20.9%	For For
Proxy Access Bylaw[5]	A request for the Board to include a "proxy access" bylaw to allow qualifying shareholders to submit nominations for director positions.	2015 2016	Defeated Passed	49.4% 61.9%	For For
Report Reserve Replacements in BTUs[6]	A request that ExxonMobil begin reporting its reserves in BTU equivalents in annual reports in annual reports or equivalent annual documents.	2016	Defeated	5.6%	Against
Report on Impact of Climate Change Policies	A request for the Board to publish an annual assessment of long-term portfolio impacts of climate change.	2016 2017	Defeated Passed	38.1% 62.1%	For For
Policy to Limit Global Warming to 2° C	A request for the Board to adopt a policy that acknowledges the need to control average temperature increases to 2 degrees.	2016	Defeated	18.5%	For
Increase Capital Distributions	A request that ExxonMobil commit to increasing capital distributions to shareholders to secure shareholder value against climate-related risk of stranded assets.	2016 2017	Defeated Defeated	4.1% 3.8%	Against Against
Report on Methane Emissions	A request that Exxon issue an annual report on company actions to reduce methane emissions from fracking operations.	2017	Defeated	38.7%	For

Exhibit 6
ExxonMobil: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Notes:

[1] This table contains all proposals voted upon from 2007–18 that express investor concern about Climate Change Regulatory Risk or whose proponents express such concern while advocating for the proposal at the annual shareholder meeting.

[2] There were no proposals in 2018 expressing investor concern about climate change regulatory risk.

[3] The Board Chairman proposal was linked to climate change regulatory risk by proponents at the 2007 annual shareholder meeting. Supporters speaking on behalf of the primary proponent explained: "The Connecticut Pension Fund and other major shareholders have requested a meeting with Michael Boskin, Chair of our Public Issues Committee and we have been turned down five times. Now our purpose for the meeting is quite simple. To have constructive dialogue with Professor Boskin on climate change, and the implication for sustaining our company's stellar performance out into the future. Now climate change may be about our planet's future, but it's also about the financial implication to compan[ies] such as ExxonMobil....As the result, we have every right to know what the company is doing, and how it will protect their -- our company's bottom line." See Thomson Reuters, Transcript of ExxonMobil Corporation Shareholders Meeting, May 30, 2007, p. 14. Likewise, the 2016 proposal was linked to climate change regulatory risk by an investment manager from CalPERS speaking on behalf of the proponent at the 2016 annual meeting: "Now is a time of great change, great risk and great opportunity for Exxon and the energy sector. Many other governments -- many other companies, large shareowners and governments all agree that the COP21 Paris agreement sets us on a path towards a low-carbon economy." See Thomson Reuters Street Events, Edited Transcript: XOM - Exxon Mobil Corp Annual Shareholders Meeting, May 25, 2016, p. 13.

[4] In 2019, a similar proposal to mandate an independent chairman was linked to climate change regulatory risk in a supporting statement that referenced "the unprecedented challenges facing global energy companies regarding climate change, as they make important transitions to a low carbon economy."

[5] The proxy access bylaw proposal was linked to climate change regulatory risk by proponents at the annual shareholder meeting. The proponents stated that "ExxonMobil received this proposal due to its exposure to risk related to climate change." See source [5], page 17.

[6] The reserve replacements reporting proposal was linked to climate change regulatory risk in the proposal text. Proponents stated that denominating reserve replacements in oil and gas units "incentiviz[es] the production and development of new oil and gas reserves. ... This fuel specific reporting metric does not allow management the latitude needed to optimize enterprise goals in a carbon constrained environment." See ExxonMobil, Form DEF 14A, 2016, p. 71.

[7] In 2019, a proposal requesting that the Board charter a new committee on climate change to evaluate ExxonMobil's strategic vision and responses to climate change, given the disruption oil companies face to their business driven by, among other climate change related factors, global imperatives to limit global warming.

Exhibit 6
ExxonMobil: Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Sources:
[1] ISS Reports, 2007–17.
[2] ExxonMobil, Form DEF 14A, 2007–19.
[3] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 30, 2007.
[4] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 27, 2015.
[5] "Edited Transcript: XOM - Exxon Mobil Corp Annual Shareholders Meeting," Thomson Reuters, May 25, 2016.
[6] ISS Voting Analytics.
[7] Proxy Monitor (Manhattan Institute for Policy Research)

Exhibit 7
ExxonMobil: Withdrawn Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title	Resolution	Year	Reason for Withdrawal
Energy Independence	A request for the Board to prepare a report to shareholders on how ExxonMobil can become an industry leader in the technology needed to make the U.S. energy independent in an environmentally sustainable fashion.	2009	"I accept [ExxonMobil's request that I withdraw the proposal], in exchange that I or my designated representative will be given up to three minutes to speak at the next annual meeting of XOM at the very beginning of the Question and Answer period. In addition the Company has promised that if I do not perceive adequate movement toward the goals of the resolution submitted this year I will be able to submit it next year without a SEC challenge from XOM, except for such technicalities around time deadline or not enough stock, not the substance of the proposal." -- *Proponent letter to ExxonMobil, March 6, 2009*
Climate Change Financial Risks	A request for the Board to prepare a report to shareholders on the financial risks of climate change and actions needed to protect long-term shareholder value.	2010	"Steve Viederman [of the Christopher Reynolds Foundation] did acknowledge that [the Foundation] had meetings with the Corporate Secretary, David Rosenthal, and different colleagues and he felt like they were very productive. And then as a result of those meetings and the dialogue, [they] withdrew the resolution." -- *Statement by Sister Susan Mika (The Needmor Fund) made on behalf of proponent at 2010 shareholder meeting, May 26, 2010*
Climate Future Task Force	A request for the Board to set up a Climate Future Task Force to study how ExxonMobil will factor climate change into its internal risk models and develop alternatives to its reliance on fossil fuels.	2012	"Last Thursday, February 2, I had an extensive conversation with David Henry, Jim Pearson, and David Rosenthal [of ExxonMobil] regarding the resolution and the challenge XOM had filed with the SEC asking for a 'no action' letter. Previous to this XOM had agreed to talk with me and the co-filers about its response to the content of the resolution. ... Because of all of these factors and Exxon Mobil's commitment to discuss the resolution and upon further examination of the issues involved to share with the shareholders and the broader public what [*sic*] we have requested in the resolution, I hereby withdraw the resolution." -- *Proponent letter to ExxonMobil, February 6, 2012*
Planning Assumptions	A request for the Board to issue a report on the risk that fossil fuel demand drops significantly below ExxonMobil projections in the next 30 years, and on the impacts of such a drop for strategic planning.	2012	[No reason stated in source materials consulted.]
Climate Change Policy Advocacy	A request for the Board to prepare a report on ExxonMobil's public policy advocacy activities on climate change and energy policy.	2014	[No reason stated in source materials consulted.]

Exhibit 7
ExxonMobil: Withdrawn Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title	Resolution	Year	Reason for Withdrawal
Climate Change Adaptation Plan	A request for the Board to issue a report on how climate change affects ExxonMobil's strategic plan.	2014	"The Christopher Reynolds Foundation withdrew its resolution report on climate change assumptions is for strategic planning following constructive discussions of Corporate Secretary, David Rosenthal and his colleagues on December 17, 2013. And subsequent discussions and exchanges of letters that resulted in Exxon's energy and climate report posted on your website and what you also have available out in the lobby." -- *Statement by Frank Rauscher (Aquinas Associates) made on behalf of proponent at 2014 shareholder meeting, May 28, 2014*
Financial Risks of Climate Change	A request for the Board to issue a report on ExxonMobil's exposure to risk from climate change, including in the form of stranded oil and gas assets.	2014	"In a much-anticipated report to shareholders today on stranded carbon asset risk, ExxonMobil expressed the view that there is limited basis for concern. Shareholder advocates Arjuna Capital and As You Sow– which withdrew a shareholder resolution when ExxonMobil agreed to release the report — expressed disappointment with aspects of the response, but noted that it is a historic first step forward ..." -- *Press Release, Arjuna Capital, March 31, 2014*
Sustainability Metrics in Executive Pay	A request for the Board to link executive compensation to company performance on sustainability metrics and environmental impacts from Company operations.	2015	"Thanks for your help in pulling together such a well informed team to discuss the issue of executive comp and Sustainability [*sic*]. We appreciate your openness in sharing information and receiving feedback. … In light of the information shared in [ExxonMobil's] letter to the SEC, the responses to our points on the call and the company's willingness to continue a dialogue about ways to strengthen transparency going forward, the Needmor Fund as the lead filer is glad to withdraw the shareholder proposal." -- *Email from proponent representative Timothy Smith to ExxonMobil representative Brian D. Tinsley, February 3, 2015*

Exhibit 7
ExxonMobil: Withdrawn Shareholder Proposals
Related to Climate Change Regulatory Risk (2007–18)

Proposal Title	Resolution	Year	Reason for Withdrawal
Review Public Policy Advocacy	A request for the Board to commission a review of Exxon public policy advocacy on energy and climate change.	2015	"Thank you for the informative conference call on climate and ExxonMobil public policy positions. In light of this dialogue and the points raised in your No Action letter regarding the overlap with a resolution on lobbying disclosure, the resolution submitted by Ken Steiner is withdrawn." -- *Email from proponent representative John Chevedden to Exxon representative Brian D. Tinsley, February 11, 2015*

Notes:
[1] This list includes withdrawn shareholder proposals that express investor concerns about ExxonMobil's Climate Change Regulatory Risk exposure. It draws from proposals identified in public SEC communications with ExxonMobil; shareholder meeting transcripts; news articles; and documents produced in discovery. Comprehensive data about all withdrawn shareholder resolutions and their content are not publicly available.
[2] ExxonMobil letters to the SEC cited in these comments refer to Exxon requests for SEC approval to omit certain shareholder resolutions from its proxy ballot, per SEC Rule 14a-8. See, e.g., Andrew R. Brownstein, David A. Katz, and Sabastian V. Niles, "Rule14a-8 Shareholder Proposals and the Government Shutdown," Harvard Law School Forum on Corporate Governance and Financial Regulation, *available at* https://corpgov.law.harvard.edu/2019/01/19/rule-14a-8-shareholder-proposals-and-the-government-shutdown/.

Sources:
[1] March 23, 2009 SEC letter to Exxon (March 6, 2009 Province of St. Joseph of the Capuchin Order letter to Exxon), https://www.sec.gov/divisions/corpfin/cf-noaction/14a-8/2009/provinceofstjoseph032309-14a8.pdf.
[2] "Transcript of ExxonMobil Corporation Shareholders Meeting," Thomson Reuters, May 26, 2010, p. 26.
[3] March 21, 2011 SEC letter to Exxon (March 16, 2011 Hitchcock Law Firm letter to Exxon), https://www.sec.gov/divisions/corpfin/cf-noaction/14a-8/2011/amalgamatedlongview032111-14a8.pdf.
[4] February 10, 2012 SEC letter to Exxon (February 6, 2012 Province of St. Joseph of the Capuchin order letter to Exxon), https://www.sec.gov/divisions/corpfin/cf-noaction/14a-8/2012/provinceofstjoseph021012-14a8.pdf.
[5] "Transcript of ExxonMobil Corporation Shareholders Meeting," S&P CapitalIQ, May 28, 2014, p. 17.
[6] "Shareholders: ExxonMobil Takes Crucial Step of Acknowledging Carbon Asset Risk ... But More is Needed," Arjuna Capital, March 31, 2014, http://arjuna-capital.com/news/shareholders-exxonmobil-takes-crucial-step-of-acknowledging-carbon-asset-risk-but-more-is-needed/.
[7] February 4, 2015 SEC letter to Exxon (February 3, 2015, Timothy Smith email to Brian D. Tinsley), https://www.sec.gov/divisions/corpfin/cf-noaction/14a-8/2015/needmorfundetal020415-14a8.pdf.
[8] February 12, 2015 SEC letter to Exxon (February 11, 2015, John Chevedden email to Brian D. Tinsley), https://www.sec.gov/divisions/corpfin/cf-noaction/14a-8/2015/kennethsteiner021215-14a8.pdf.
[9] Brownstein, Andrew R., David A. Katz, and Sabastian V. Niles, "Rule14a-8 Shareholder Proposals and the Government Shutdown," Harvard Law School Forum on Corporate Governance and Financial Regulation, January 19, 2019, https://corpgov.law.harvard.edu/2019/01/19/rule-14a-8-shareholder-proposals-and-the-government-shutdown/.

Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
Barclays	3/5/2012	"Kearl oil sands development – what is the unit operating cost? What additional cost have you built in for the expected new carbon tax scheme?" [2] (p. 4)
BMO	12/1/2016	"Climate change. It is a tough job being an oil major these days, especially so if you are the biggest. Climate change threatens stranding resources long term, while near-term balancing of the oil markets puts an opposing threat on resource renewal and fighting field declines and then making the best of industry costs conditions to deliver FCF." (p. 11) "Climate change pressures. Adapting to climate change is putting pressure on the sector. Exxon has not taken a positive leadership role in the climate change debate. We appreciate that as an oil company it should stick to its core competencies of delivering oil & gas projects in the most efficient manner; however, we see companies such as Total better positioned. The election of Trump in the U.S. may take some of the immediate pressures off Exxon; however, we think that ultimately the pressure to adapt will only increase." (p. 11) "U.S. Energy Policy: It is not clear what the new President Elect's strategy will be for power generation and coal suppliers, which can be a threat to Exxon due to its Henry Hub exposure." (p. 11) "Investment risks include project execution, persistent LNG market oversupply concerns, lack of a clear climate change initiative, non-OECD production, and failure to grow the resource base organically. SEC proved reserves writedowns are near-term risks."[3] (p. 99)
Cowen & Company	3/1/2018	"We believe XOM must do three things to affect a positive outcome from its analyst day (3/7/18): 1) demonstrate efficiency in Permian development in line with independents, 2) illustrate integration value of downstream growth, and 3) tie together carbon reduction efforts with the core business." (p. 1)
	3/7/2018	"The afternoon session was a panel on the long term global energy demand outlook and efforts to reduce carbon emissions. Emissions reduction can be achieved a variety of ways, but direct efforts include R&D efforts in fuel cells for carbon capture and oils produced from algae, a CO2 consumer. As it relates to a current investment in XOM shares, both efforts will likely not be commercialized until the 2030s, however we see synergies in the core business from both initiatives and we are particularly interested in fuel cell carbon capture, as wide adoption would increase lng demand materially over the investible horizon before 2040." (p. 3)
Credit Suisse	4/9/2014	"Exxon says oil reserves in no danger from climate rules (Apr 1, 2014) Exxon Mobil Corp. said its oil and natural gas reserves won't become stranded and lose their value as a result of carbon restrictions aimed at addressing climate change." (p. 11)

Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
Deutsche Bank	1/21/2010	"Anyone who knows XOM well knows Tillerson accepts global warming [.] Tillerson revealed XOM's 'price deck' (thought non-existent?) includes a price for carbon; they recognise human activity contributes to global warming but as a science and engineering company they do not recognise a dependable model for past, let alone forecast, emissions impacts. They support the honest solution that many politicians do not: carbon tax. Natgas and efficiency are two key mitigators of risk; cap and trade is not, because of excessive cost and complexity. They seek the XTO deal to gain scale in their forecast biggest absolute demand growth fuel." (p. 1)
	1/11/2012	"Further risk at home lies in a Democratic Congress determined to ramp up renewable energy and make 'big oil' finance it. Other downside risks to our neutral rating include shrinking access abroad, falling demand, an expensive acquisition, and potential US tax and renewable fuel legislation."[4] (p. 18)
	6/4/2017	[Discussing a 2017 proxy vote in favor of additional climate disclosures] "The vote underpins the shift in investor sentiment as it pertains to environmental cost analysis. Perhaps what was once an easily disregarded notion is now a key analytical factor that large asset owners are proactively seeking answers to. We do note however, that the agreement is not binding. In our view, a paradigm shift to a low carbon economy necessitates steps like these to occur, and we see this as perhaps a catalyst going forward." (p. 4)
	10/31/2018	"DB ESG conference: physical climate risk. Increasingly real. Pressure for more disclosure and mitigation actions" (p. 1) [Following discussion of NY AG complaint] "We understand that many of these assumptions are around $40/tCO2, but there is clearly little transparency as to how they are used, and to what extent they are assumed to be tax deductible. Moreover, it is our understanding that while these prices may be deployed in specific project economics, they are rarely used when modelling future demand curves and market prices for oil and gas – a clear inconsistency (however complicated the oil market may be)." (p. 14) "Investors concerned about the potential for stranded assets or excessive book values are also focusing on the inconsistency between the oil prices used to benchmark final investment decisions (often in the $40-50/bbl range) and those used in the long term tests of balance sheet values (currently $60-70/bbl). Auditors may now find themselves tending towards greater prudence in closing (*and disclosing*) this gap." (p. 14)
Evercore ISI	7/5/2016	"The future of the major international oil companies (IOCs) - BP, Chevron, ExxonMobil, Shell and Total - is in doubt. The business model that sustained them during the 20th century is no longer fit for purpose. As a result, they are faced with the choice of managing a gentle decline by downsizing or risking a rapid collapse by trying to carry on business as usual. [...] The petroleum industry faces numerous strategic challenges, rising to the level of apocalyptic. Climate change means fossil fuels must be left in the ground, according to some, and new technologies like electric vehicles will displace demand for oil and gas…" (p. 5)
HSBC	Sep-2015	"ExxonMobil addresses the potential for future climate-related controls, through the use of a proxy cost of carbon, which may approach USD80/tonne." (p. 11)

Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
JPMorgan	3/4/2013	"We believe XOM's annual Outlook for Energy publication is particularly instructive in understanding XOM's perspective on the long-term energy picture, which ultimately drives its investment decisions." (p. 2)
	12/16/2015	"Industry observers note that corporates and financial firms were "out in force" in Paris, shaping national and international initiatives, giving momentum and texture to initiatives such as carbon pricing. Just as Climate Change Denial might be bad for the planet, so COP21 denial might be bad for investors..." (p. 2) "Global oil companies generally committed to using internal carbon pricing (e.g. Exxon Mobile $80- sic), and to reduce CO2 emissions." (p. 4)
Macquarie	6/6/2017	"Recent CDP research found that close to half of Fortune 500 companies have one or more climate change targets, with 15% specifically targeting a level of investment in clean energy. This has been catalysed by the growing chorus of investors engaging with companies to seek improvements in climate change performance. A good recent example of this was the 62% shareholder support for a shareholder resolution requiring Exxon to publish an annual assessment of climate policies. The Investor Group on Climate Change coordinated more than 280 investors with over $17 Trillion in assets under management to sign a joint letter calling on Governments to implement the Paris Agreement." (p. 5)
Morgan Stanley	8/9/2017	"At least 14 of 19 top oil & gas companies include environmental metrics in executive compensation, though there is no consensus on implementation. In N. America, among the top 10 oil & gas companies, all but 2 (Exxon, Occidental) have at least some environmental component in their short-term cash goals. By contrast, in Europe, 3 of the top 9 companies (Shell, BP, OMV) have introduced environment as part of longer-term criteria (where we think it belongs), and 4 others include it in the annual cash bonus." (p. 1) "The two US companies without environment exec comp metrics also faced strongest climate change proposal votes and lowest Say on Pay approvals (Exxon, Occidental). Meanwhile, 7 of the 8 N. American companies with executive compensation plans incorporating some climate metrics did not face climate change shareholder resolution votes >25% last year (except Chevron)." (p. 1) "The most recent US proxy season stands out for notable shareholder resolution votes on climate change – namely those that passed with a majority in favor of fossil fuel companies reporting on carbon asset risk, such as Exxon (62% votes for) and Occidental (67% votes for) – all contrary to their managements' recommendations to vote against." (p. 3) "Other than Exxon and Occidental, the remainder of the top 10 US oil & gas companies by market cap have at least some explicit environmental metric, usually within annual bonus cash." (p. 7) "Recently, Swedish pension fund AP7 targeted companies it believes are violating the Paris climate agreement – which included ExxonMobil, Gazprom, TransCanada, Westar, Entergy, and Southern Corp. This has become a routine screening in their investment process." (p. 10)

Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
Oppenheimer	4/8/2011	"XOM believes uncertainties about future government policies including environmental regulations on emissions, oil spills, hydraulic fracturing, restricting access to potential hydrocarbon resources, as well as changes in fiscal regimes, pose a greater risk than reserve replacement or volatile oil and gas prices and refining margins." (p. 1)
RBC	4/22/2010	"With almost 2.0 million bpd of U.S. refining capacity, ExxonMobil's downstream earnings could be lowered by costs related to greenhouse gas emission legislation, which is being debated in Washington, D.C. Additionally, potential tax law changes could negatively affect Upstream earnings and cash flow."[5] (p. 4)
Société Générale	Sep-2014	"According to findings from CDP's (Carbon Disclosure Project), ExxonMobil and Shell have integrated an 'internal carbon price' as a core element in their ongoing business strategies; ExxonMobil is assuming a cost of $60 per metric ton by 2030, while Shell uses a price of $40 per ton. However, further disclosure and analysis of cost of supply and carbon intensity is needed for investors to understand which projects might be at risk...Current and future CO2 regulation policies of the markets into which the company's products will be sold are evaluated including, for example, the possible impact of low carbon fuel standards." (p. 28)
	3/22/2016	"Any material changes to regulations that limit the company's ability to exploit reserves or make it prohibitively expensive to do so could impact the company's value. Future climate change regulations or taxes that limit the company's ability to exploit reserves, make them prohibitively expensive to extract, or significantly curtail demand for end petroleum products, could materially impact the company's value."[6] (p. 1)
	9/21/2018	"Management is fully cognizant of the need to deliver energy for growing global economic growth while reducing its environmental impacts. Already, XOM is a leader in carbon sequestration, has plans to reduce methane emissions by 15% and flaring by 20% by 2020, and has just joined the Oil & Gas Climate Initiative. So, XOM is investing and operating in a manner to profit in a world in which energy efficiency, de-carbonization trends, and political policy decisions will affect future hydrocarbon consumption." (p. 1)

Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
UBS	4/1/2014	"ExxonMobil released its reports yesterday to shareholders on managing climate risk. The company says that its hydrocarbon reserves are unlikely to become 'stranded' because of regulations to limit climate change. It says limiting the temperature increase to 2°C would be too costly given the growing energy needs. ExxonMobil expects carbon fuels to continue to play a key role in the energy mix (~75% through 2040). Exxon also gives more details on its plans to reduce its own emissions. (Exxon, UBS)" (p. 3)
	9/7/2018	"Firstly, XOM's more constructive engagement in the debate around climate change at the outlook for the oil and gas market makes the strategy more credible because investors will see it as having been formulated in a view of the world that accords with their own – that climate change and the impact of energy transition is a potentially existential issue for the oil and gas world; That while the market evolution may mean all the resources get produced out there may be price impacts along the way. Therefore being positioned in the best, lowest cost projects is a critical strategic position which we do believe XOM has made convincingly (XOM's base case $60/bbl real price assumption suggests robust returns even in the context of slowing demand). We see little risk of 'stranded assets' emerging out of the current investment plan. We have reviewed current longer-term energy market thinking in a separate note." (p. 37) "[CEO Darren] Woods' ExxonMobil is carrying on the trend under Tillerson and addressing more constructively issues of climate change and ESG issues." (p. 39)
Wells Fargo	6/20/2013	"Proposals with regard to the removal of intangible drilling credits (IDC) and other incentives, GHG emissions, fracking regulations, and derivative contract regulations are just some of the issues that may negatively affect the E&P industry, in our opinion." (p. 6)
	5/30/2016	"XOM and the oil and gas sector face a series of challenges related to conventional emissions and increasing requirements to reduce GHG emissions. XOM is focused on the reduction of GHG emissions as well as carbon capture and storage as permanent solutions to reduce CO2 levels. While we did not attend the annual shareholder meeting on Wednesday, May 25, 2016, all of these topics were widely discussed." (p. 2) "To guard against future expenses related to GHG regulations, a direct carbon tax or carbon trading schemes, XOM places a proxy cost of carbon on all of its future developments. Depending on the project and its location, the proxy cost of carbon ranges from $20 to $80 per ton by 2040. This approach reduces the risks associated with future CO2 emissions and incentivizes XOM to reduce overall emissions of all future projects. Also, all future project economics will not be negatively affected by future GHG rules, regulations and taxes. This approach also helps XOM avoid the risk of stranded investments." (p. 2)

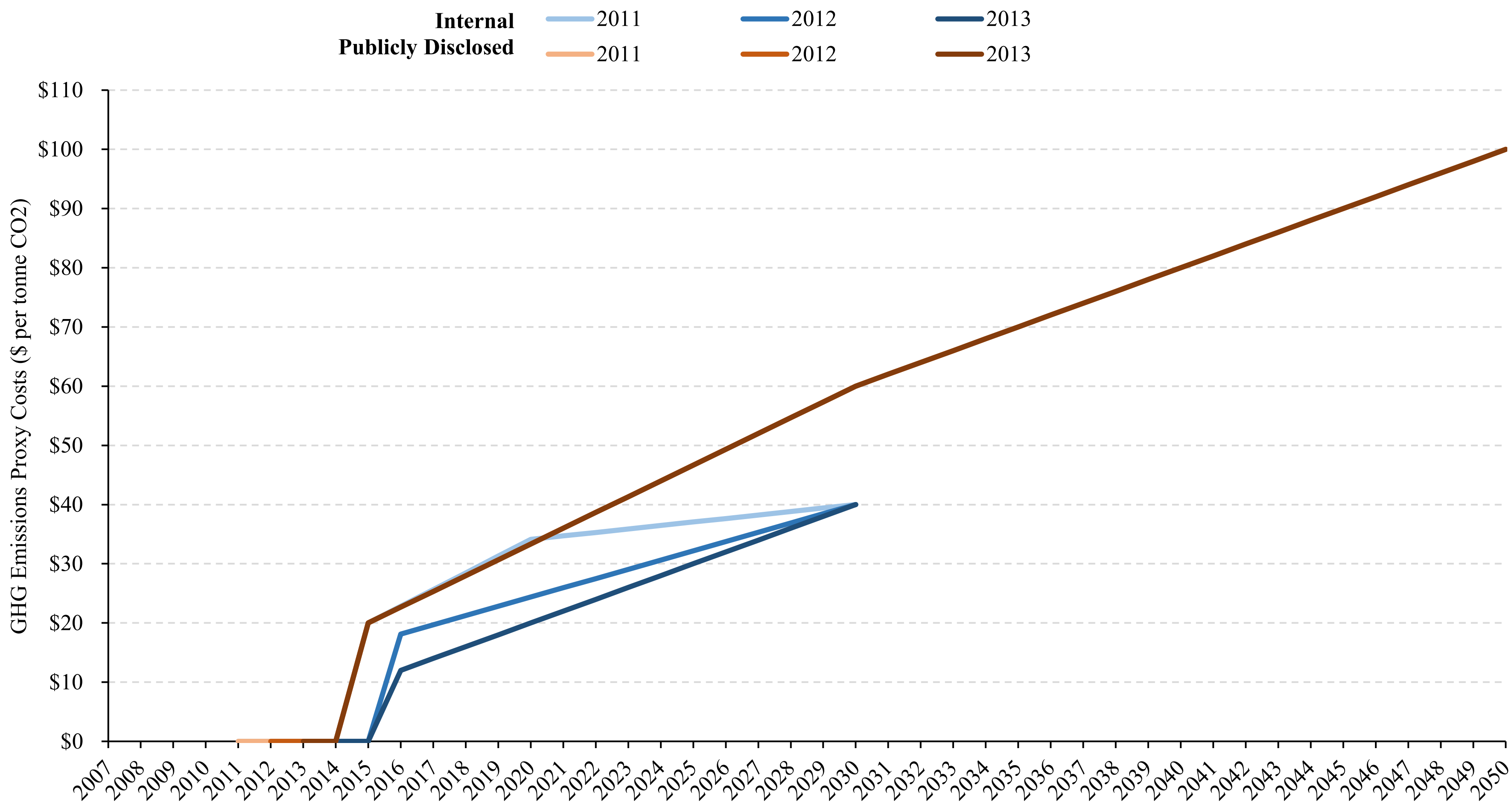
Exhibit 8
Equity Research Analyst Commentary on ExxonMobil Climate Change Regulatory Risks

Analyst [1]	Date	Selected Excerpts
Wells Fargo (continued)	9/20/2016	"We rate the likelihood of a negative outcome from a reported SEC investigation into ExxonMobil's accounting/climate practices as very slight. However, in our view the headline risks associated with an SEC investigation create enough investor angst to damage ExxonMobil's reputation and impact its share price performance during the investigation period. Thus we are reducing our target P/E multiple to 18x from 20x our 2018 EPS estimate and reducing our valuation range to $93-103 from $103-114. Our rating remains Outperform." (p. 1) "ExxonMobil found itself in the news earlier this year from investigations by various international and states' attorneys general of its actions/inactions related to man-made climate change (though the climate has been remarkably stable during the time of man compared to its pre-mankind days)." (p. 1) "On May 26, 2016, we hosted a group of investors at ExxonMobil's HQ and discussed climate risks including stranded assets. As discussed then, XOM places a proxy cost of carbon on all of its future developments. Depending on the project and its location, the proxy cost of carbon ranges from $20 to $80 per ton by 2040. This approach reduces the risks associated with future CO2 emissions and incentivizes XOM to reduce overall emissions of all future projects. Thus we believe ExxonMobil is ahead of the curve on pricing in climate risks." (p. 1)
	8/17/2017	"[Exxon] remains the leading energy company in our view." (p. 1) "All XOM projects are assessed an internal carbon tax (on a per ton basis) to take into account carbon intensity. This is very important for long-lived projects to ensure full-cycle returns are fairly evaluated on an environmental basis as well as financial and operational. While the technology does not exist commercially today, carbon capture and storage (CCS) should be a component of long-term CO2 solutions in XOM's view." (p. 2)

Notes:
[1] This commentary was selected from equity research analyst reports from the 16 investment banks whose coverage of Exxon spanned the longest period since 2010 that were available through Thomson One's Investext subscription. That includes Barclays, Bank of Montreal ("BMO"), Cowen & Company, Credit Suisse, Deutsche Bank, Evercore ISI, HSBC, Jefferies, JPMorgan, Macquarie, Morgan Stanley, Oppenheimer, RBC, Société Générale, UBS, and Wells Fargo. Commentary is drawn from reports from these banks which discussed ExxonMobil's climate change regulatory risk or GHG Emission Proxy Costs.
[2] This question appears in at least one other Barclays report in 2011.
[3] This risk appears in at least seven other BMO reports between 2016 and 2017.
[4] This risk appears in at least 12 other Deutsche Bank reports between 2010 and 2012 (11 of which are not included in this exhibit).
[5] This risk appears in at least 12 other RBC reports between 2010 and 2012.
[6] This risk appears in at least 43 other Société Générale reports between 2016 and 2019 (42 of which are not included in this exhibit).

Sources:
[1] Thomson One.
[2] BOA-NYAG-EXXON-000002199.

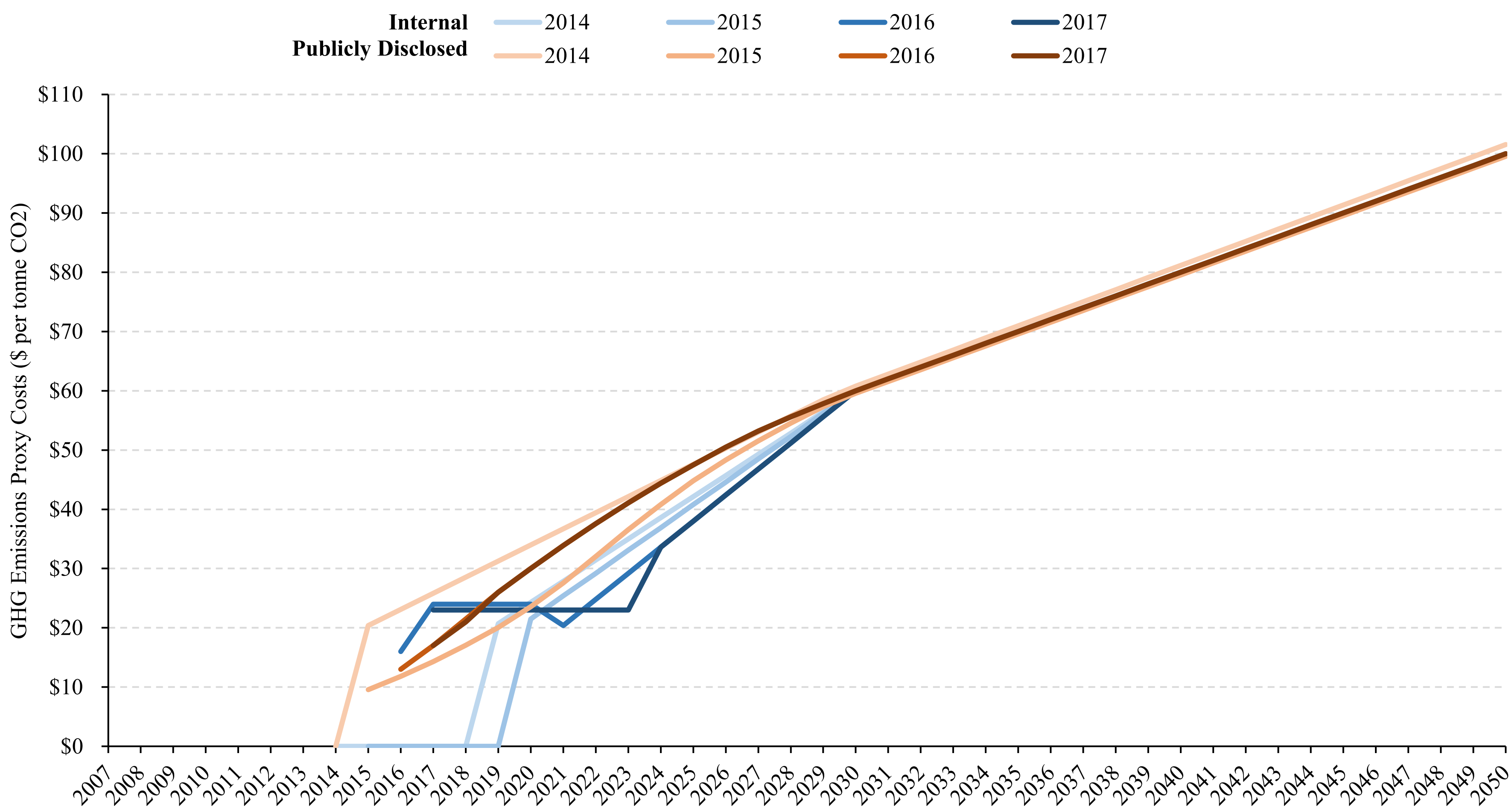
Exhibit 9.A
ExxonMobil Internal and Publicly Disclosed GHG Emission Proxy Cost Schedules
OECD Non-EU Nations
2011–2013



Notes:
[1] The specific nations subject to the GHG Emissions Proxy Cost schedules above may vary slightly between years.

Sources:
[1] Corporate Planning Dataguides for 2011–2013.
[2] Energy Outlook reports for 2011–2013.

Exhibit 9.B
ExxonMobil Internal and Publicly Disclosed GHG Emission Proxy Cost Schedules
OECD Non-EU Nations
2014–2017



Notes:
[1] The specific nations subject to the GHG Emissions Proxy Cost schedules above may vary slightly between years.

Sources:
[1] Corporate Planning Dataguides for 2014–2017.
[2] Energy Outlook reports for 2014–2017.

Exhibit 10
ExxonMobil Financial Models Considered

No.	Project, Asset, or Investment[1]	Year	Bates Number	Type[2]	Original Source of GHG Emission Proxy Cost	Original % of Emissions to which Cost is Applied
Models Selected for Analysis						
1	Antwerp (Europe Residual Upgrade)	2014	EMC 004046554	Investment	Unknown	100% (above threshold)[6]
2	Aspen (Advance Commitment 2)	2014	EMC 003697673	Investment	Dataguide 2013	100%
3	Beaumont (SCANfiner)	2014	EMC 004046572	Investment	Dataguide 2014 (with adjustments)[4]	100%
4	Cold Lake (Nabiye)	2012	EMC 004046570	Investment	Dataguide 2010 (with adjustments)[4]	100%
5	Kearl (De-Oxygenation)	2015	EMC 004046565	Investment	Dataguide 2013	100%
6	Kearl (Initial Development Cogeneration)	2013	EMC 004046561	Investment	Legislated Costs	100% (above threshold)[6]
7	Kearl (Phase 2 Expansion)	2012	EMC 004046560	Investment	Dataguide 2009	100%
8	Rotterdam (Refinery Advanced Hydrocracker)	2015	EMC 004322890	Investment	Unknown	100%
9	Clarke Creek (Phase 1)	2014	EMC 003697597	Corporate Planning	Dataguide 2013	100%
10	Clarke Creek (Phase 2)	2014	EMC 003697587	Corporate Planning	Dataguide 2013	100%
11	Clarke Creek (Phase 3)	2014	EMC 003697588	Corporate Planning	Dataguide 2013	100%
12	Clyden (Phase 1)	2014	EMC 003697598	Corporate Planning	Dataguide 2013	100%
13	Clyden (Phase 2)	2014	EMC 003697573	Corporate Planning	Dataguide 2013	100%
14	Clyden (Phase 3)	2014	EMC 003697575	Corporate Planning	Dataguide 2013	100%
15	Corner (Phase 1)	2014	EMC 003697599	Corporate Planning	Dataguide 2013	100%
16	Corner (Phase 2)	2014	EMC 003697579	Corporate Planning	Dataguide 2013	100%
17	Corner (Phase 3)	2014	EMC 003697581	Corporate Planning	Dataguide 2013	100%
18	Firebag	2014	EMC 003697626	Corporate Planning	Dataguide 2008	100%
19	Grand Rapids (Phase 1)	2014	EMC 003697600	Corporate Planning	Dataguide 2013	100%
20	Grand Rapids (Phase 2)	2014	EMC 003697601	Corporate Planning	Dataguide 2013	100%
21	Grand Rapids (2014 Corporate Plan)	2014	EMC 003697583	Corporate Planning	Dataguide 2013	100%
22	Kearl (Initial Development, Expansion Project, and Plant Debottleneck)	2015	EMC 003697717	Corporate Planning	Corporate SSHE (June 2015)[5]	20%
23	Kearl (2013 P&B)	2013	EMC 003697627	Corporate Planning	Dataguide 2012	100%
24	Muskeg	2014	EMC 003697563	Corporate Planning	Dataguide 2013	100%
25	Kearl (Economic Model Validation)	2013	EMC 003697946	Economic Model Validation	Dataguide 2013	100%
26	Aspen (Reserves)	2015	EMC 003976219	Other[3]	Unknown	20%
27	Kearl (Economic Model - CP15 FA October - CAF Reserves, YEO update, 255 in 2025)	2015	IMO_00003599	Other[3]	Corporate SSHE (June 2015)[5]	20%
Input Models						
1	Aspen (Advance Commitment 2)	2014	EMC 003697674	Input		
2	Aspen (Advance Commitment 3)	2015	EMC 002879325	Input		
3	Aspen (Reserves)	2015	EMC 003976220	Input		
4	Baytown (Refinery Lubes Expansion)	2013	EMC 004322516	Input		
5	Clarke Creek (Phase 1)	2014	EMC 003697612	Input		
6	Clarke Creek (Phase 2)	2014	EMC 003697568	Input		
7	Clarke Creek (Phase 3)	2014	EMC 003697570	Input		
8	Clyden (Phase 1)	2014	EMC 003697572	Input		
9	Clyden (Phase 2)	2014	EMC 003697574	Input		
10	Clyden (Phase 3)	2014	EMC 003697576	Input		
11	Corner (Phase 1)	2014	EMC 003697614	Input		
12	Corner (Phase 2)	2014	EMC 003697580	Input		
13	Corner (Phase 3)	2014	EMC 003697582	Input		
14	Grand Rapids (Phase 1)	2014	EMC 003697615	Input		
15	Grand Rapids (Phase 2)	2014	EMC 003697616	Input		
16	Grand Rapids (Midzaghe) (2015 Corporate Plan)	2015	EMC 003697497	Input		
17	Muskeg	2014	EMC 003697608	Input		
Models Created in 2016 or Later						
1	Aspen	2018	EMC 004046571	Investment		
2	Beaumont (Polyethylene Expansion)	2016	EMC 004322515	Investment		
3	Cepu (Banyu Urip Supplement)	2016	EMC 004046564	Investment		
4	Gorgon (PM-SURF)	2018	EMC 004046557	Investment		
5	Guyana (Liza Phase 1)	2017	EMC 004046568	Investment		
6	Guyana (Gate 2, Advance Commitment 1)	2016	EMC 003973954	Investment		
7	Julia (Development Well)	2016	EMC 004046566	Investment		
8	Tengiz (Kazakhstan) (Tengiz Expansion Project, Advance Commitment #7)	2016	EMC 003150586	Investment		
9	XTO Assets (2016 Corporate Plan)	2016	PNYAG0335024	Corporate Planning		
10	Kearl (Economic Model - CP16 RVP)	2016	IMO_00007662	Corporate Planning		

Exhibit 10
ExxonMobil Financial Models Considered

No.	Project, Asset, or Investment[1]	Year	Bates Number	Type[2]	Original Source of GHG Emission Proxy Cost	Original % of Emissions to which Cost is Applied
Models without Explicit GHG Emissions Proxy Costs in Net Cash Flows						
1	Baytown (Chemical Plant Metallocene Polyalphaolefin (MPAO))	2011	EMC 004322518	Investment		
2	Baton Rouge (Sulfur Capacity Expansion)	2014	EMC 004046578	Investment		
3	Baton Rouge (Sulfur Capacity Expansion)	2014	EMC 004046579	Investment		
4	Beaumont (Refinery Crude Unit A Flexibility/Energy Conservation)	2015	EMC 004322517	Investment		
5	Cepu (Banyu Urip)	2011	EMC 004046558	Investment		
6	Hebron (Hebron Project)	2012	EMC 004046567	Investment		
7	Horn River (Horn River Pilot)	2011	EMC 004046559	Investment		
8	Julia	2013	EMC 004046569	Investment		
9	Kearl (Debottleneck) (Advance Commitment 1)	2014	EMC 003697670	Investment		
10	Point Thomson (Point Thomson Initial Production System)	2012	EMC 004046576	Investment		
11	Rotterdam (Hydrogen Supply)	2010	EMC 002679001	Investment		
12	Sakhalin (Arkutun-Dagi Field Development)	2010	EMC 004046555	Investment		
13	Sakhalin (Chayvo Production Facility Expansion)	2010	EMC 004046556	Investment		
14	Sakhalin (Odoptu Stage 2)	2014	EMC 004046563	Investment		
15	Syncrude (Mildred Lake Mine Replacement)	2012	EMC 004046562	Investment		
16	Syncrude (Syncrude Aurora North Mine Relocation)	2012	EMC 004046577	Investment		
17	Tapis (Tapis Enhanced Oil Recovery and Rejuvenation)	2011	EMC 004046580	Investment		
18	XTO Assets (2015 Corporate Plan)	2015	PNYAG0343042	Corporate Planning		
	Total Number of Models Received		**72**			
	Total Number of Models Included in Sample		**27**			

Notes:
[1] Table excludes four impairment models received from counsel, as well as three models received from counsel that are earlier versions of other models in this table.
[2] Inferred based on information provided by ExxonMobil. Models are classified as "investment" if they are labeled as "full funding" or "advance commitment" models by ExxonMobil. See sources [1–3].
[3] Models cannot be classified as "investment," "corporate planning," "input," or "economic model validation," based on ExxonMobil documentation or information from the models themselves. However, ExxonMobil documentation and information from the models indicate that these models are involved in reserves assessments. See source [1].
[4] Models make minor adjustments to Dataguide-specified schedules for certain years at the start or end of the applied cost schedules.
[5] Models cite June 2015 information from the Corporate Safety, Security, Health, and Environment (SSHE) department as the source of their cost schedule. See source [6].
[6] Models have GHG Emissions Proxy Costs applied in full, but only on emissions above a certain threshold.

Sources:
[1] Defendant's Responses and Objections to the Attorney General's Contention Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, May 1, 2019, Appendix
[2] Exxon Mobil Corporation's Responses and Objections to the Attorney General's Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 451962/2016, October 1, 2018.
[3] Letter from Justin Anderson to Kevin Wallace, *Re: People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, April 12, 2019, Appendix A.
[4] Letter from Nora Ahmed to Manisha Sheth and Jonathan Zweig, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , September 28, 2018.
[5] Letter from Nora Ahmed to John Oleske and Katherine Milgram, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , July 9, 2018.
[6] Deposition of Dan Hoy *(Imperial Oil Project Manager, 2005-2018)* , April 25, 2019, p. 73.
[7] EMC 001621806, Internal ExxonMobil spreadsheets and charts on certain Alberta assets.
[8] EMC 003680301, 2016 Strategic Framing Discussion, February 8, 2016, p. 23.
[9] EMC 003697671, Internal ExxonMobil Email from Lucie Cornish, August 15, 2014.
[10] EMC 001594743, ExxonMobil Corporate Plan Dataguide for 2008 - Revision 2, Appendices, September 24, 2008.
[11] EMC 001596274, ExxonMobil Corporate Plan Dataguide for 2009 - Revision 1, Appendices, July 8, 2009.
[12] EMC 001598610, ExxonMobil Corporate Plan Dataguide for 2010 - Revision 2, Appendices, October 18, 2010, p. 37.
[13] EMC 001613011, ExxonMobil Corporate Plan Dataguide for 2012 - Revision 1b, Appendices, September 5, 2012, p. 34.
[14] EMC 001764946, ExxonMobil Corporate Plan Dataguide for 2013 - Revision 3, Appendices, December 30, 2013, pp. 31–32.
[15] EMC 001608351, ExxonMobil Corporate Plan Dataguide for 2014 - Revision 3, Appendices, December 30, 2014, pp. 31–32.

Exhibit 11
Cash Flow Analysis of ExxonMobil Projects
GHG Emission Proxy Cost Adjustment

			Original Model			Updated Cost Schedule[4]			Difference Between Original and Updated Model				
Project, Asset, or Investment[1]	Year	Type[2]	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	UCF (%)	NPV (%)	IRR (%)
Antwerp (Europe Residual Upgrade)	2014	Investment	$6,841	$1,212	17.3%	$6,801	$1,200	17.2%	($40)	($11)	-0.6%	-0.9%	-0.1%
Aspen (Advance Commitment 2)	2014	Investment	$9,444	$497	15.6%	$8,639	$403	15.0%	($804)	($94)	-8.5%	-18.9%	-0.6%
Aspen (Reserves)	2015	Other[3]	$16,273	$1,545	23.1%	$16,060	$1,526	23.0%	($214)	($19)	-1.3%	-1.2%	-0.1%
Beaumont (SCANfiner)	2014	Investment	$2,877	$275	23.8%	$2,872	$274	23.7%	($5)	($2)	-0.2%	-0.6%	-0.1%
Clarke Creek (Phase 1)	2014	Corporate Planning	$8,595	($26)	11.4%	$7,228	($71)	10.3%	($1,368)	($45)	-15.9%	-171.9%	-1.1%
Clarke Creek (Phase 2)	2014	Corporate Planning	$9,419	$122	18.0%	$8,057	$90	16.7%	($1,363)	($32)	-14.5%	-26.3%	-1.4%
Clarke Creek (Phase 3)	2014	Corporate Planning	$9,619	$111	18.0%	$8,193	$80	16.6%	($1,427)	($31)	-14.8%	-27.6%	-1.4%
Clyden (Phase 1)	2014	Corporate Planning	$9,679	$63	13.1%	$8,522	$15	12.3%	($1,157)	($48)	-12.0%	-76.4%	-0.8%
Clyden (Phase 2)	2014	Corporate Planning	$9,864	$196	16.9%	$8,751	$154	16.0%	($1,113)	($42)	-11.3%	-21.5%	-0.9%
Clyden (Phase 3)	2014	Corporate Planning	$10,092	$180	16.9%	$8,919	$140	16.0%	($1,174)	($41)	-11.6%	-22.5%	-0.9%
Cold Lake (Nabiye)	2012	Investment	$2,928	($177)	10.2%	$2,322	($229)	9.5%	($606)	($52)	-20.7%	-29.4%	-0.7%
Corner (Phase 1)	2014	Corporate Planning	$9,036	$83	13.1%	$8,068	$30	12.4%	($968)	($53)	-10.7%	-63.8%	-0.7%
Corner (Phase 2)	2014	Corporate Planning	$9,426	$232	16.8%	$8,433	$187	16.0%	($994)	($46)	-10.5%	-19.8%	-0.8%
Corner (Phase 3)	2014	Corporate Planning	$9,643	$214	16.9%	$8,591	$170	16.0%	($1,053)	($44)	-10.9%	-20.6%	-0.9%
Firebag	2014	Corporate Planning	$136,504	($2,199)	8.7%	$129,372	($2,419)	8.3%	($7,132)	($220)	-5.2%	-10.0%	-0.4%
Grand Rapids (2014 Corporate Plan)	2014	Corporate Planning	$1,541	($60)	10.3%	$1,399	($77)	9.7%	($142)	($17)	-9.2%	-28.3%	-0.5%
Grand Rapids (Phase 1)	2014	Corporate Planning	$7,833	($51)	11.3%	$6,822	($106)	10.6%	($1,011)	($54)	-12.9%	-105.8%	-0.8%
Grand Rapids (Phase 2)	2014	Corporate Planning	$8,452	$119	14.1%	$7,384	$67	13.2%	($1,069)	($52)	-12.6%	-43.9%	-0.9%
Kearl (2013 P&B)	2013	Corporate Planning	$104,904	($17,769)	7.2%	$100,843	($18,005)	7.1%	($4,061)	($236)	-3.9%	-1.3%	-0.1%
Kearl (De-Oxygenation)	2015	Investment	$109,566	($23,615)	6.7%	$104,207	($24,080)	6.6%	($5,359)	($465)	-4.9%	-2.0%	-0.1%
Kearl (Economic Model - CP15 FA October - CAF Reserves, YEO update, 255 in 2025)	2015	Other[3]	$63,153	($26,495)	4.7%	$61,803	($26,600)	4.7%	($1,350)	($105)	-2.1%	-0.4%	-0.1%
Kearl (Economic Model Validation)	2013	Economic Model Validation	$110,966	($16,556)	7.6%	$106,400	($16,946)	7.4%	($4,566)	($390)	-4.1%	-2.4%	-0.1%
Kearl (Initial Development Cogeneration)	2013	Investment	$122,874	($8,565)	9.2%	$122,075	($8,623)	9.2%	($799)	($58)	-0.7%	-0.7%	0.0%
Kearl (Initial Development, Expansion Project, and Plant Debottleneck)	2015	Corporate Planning	$94,290	($26,508)	5.5%	$92,513	($26,618)	5.4%	($1,777)	($110)	-1.9%	-0.4%	-0.1%
Kearl (Phase 2 Expansion)	2012	Investment	$65,563	($13,286)	5.8%	$62,017	($13,460)	5.7%	($3,546)	($175)	-5.4%	-1.3%	-0.2%
Muskeg	2014	Corporate Planning	$9,096	$86	15.2%	$7,734	$50	14.0%	($1,363)	($36)	-15.0%	-41.8%	-1.3%
Rotterdam (Refinery Advanced Hydrocracker)	2015	Investment	$11,472	$1,357	22.5%	$11,423	$1,349	22.4%	($49)	($8)	-0.4%	-0.6%	-0.1%
Total / Average			**$969,953**	**($129,015)**	**13.3%**	**$925,445**	**($131,500)**	**12.8%**	**($44,508)**	**($2,485)**	**-4.6%**	**-1.9%**	**-0.6%**

Exhibit 11
Cash Flow Analysis of ExxonMobil Projects
GHG Emission Proxy Cost Adjustment

Notes:
[1] Includes projects that were created before 2016 and that contain a GHG Emission Proxy Cost in projected cash flows.
[2] Inferred based on information provided by ExxonMobil. Models are classified as "investment" if they are labeled as "full funding" or "advance commitment" models by ExxonMobil. *See* Sources [1–3]
[3] Models cannot be classified as "investment," "corporate planning," "input," or "economic model validation," based on ExxonMobil documentation or information from the models themselves. However, ExxonMobil documentation and information from the models indicate that these models are involved in reserves assessments. *See* Source [1].
[4] Updated GHG Emission Proxy Cost basis is taken from external Energy Outlook schedules a year prior to the model year.

Sources:
[1] Exxon Mobil Corporation's Responses and Objections to the Attorney General's Contention Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, May 1, 2019, Appendix
[2] Exxon Mobil Corporation's Responses and Objections to the Attorney General's Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 451962/2016, October 1, 2018.
[3] Letter from Justin Anderson to Kevin Wallace, *Re: People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, April 12, 2019, Appendix A.
[4] Letter from Nora Ahmed to Manisha Sheth and Jonathan Zweig, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , September 28, 2018.
[5] Letter from Nora Ahmed to John Oleske and Katherine Milgram, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , July 9, 2018.
[6] EMC 001621806, Internal ExxonMobil spreadsheets and charts on certain Alberta assets.
[7] EMC 003680301, 2016 Strategic Framing Discussion, February 8, 2016, p. 23.
[8] EMC 003697671, Internal ExxonMobil Email from Lucie Cornish, August 15, 2014.
[9] *See* Exhibit VI.2 for a list of each model's Bates number.

Exhibit 12
Cash Flow Analysis of ExxonMobil Projects
GHG Emission Proxy Cost and Percentage Emissions Adjustment

			Original Model			Updated Costs and Emissions[4]			Difference Between Original and Updated Model				
Project, Asset, or Investment[1]	Year	Type[2]	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	UCF (%)	NPV (%)	IRR (%)
Antwerp (Europe Residual Upgrade)	2014	Investment	$6,841	$1,212	17.3%	$6,591	$1,143	16.9%	($250)	($69)	-3.7%	-5.7%	-0.3%
Aspen (Advance Commitment 2)	2014	Investment	$9,444	$497	15.6%	$8,639	$403	15.0%	($804)	($94)	-8.5%	-18.9%	-0.6%
Aspen (Reserves)	2015	Other[3]	$16,273	$1,545	23.1%	$14,761	$1,386	22.2%	($1,512)	($159)	-9.3%	-10.3%	-0.8%
Beaumont (SCANfiner)	2014	Investment	$2,877	$275	23.8%	$2,872	$274	23.7%	($5)	($2)	-0.2%	-0.6%	-0.1%
Clarke Creek (Phase 1)	2014	Corporate Planning	$8,595	($26)	11.4%	$7,228	($71)	10.3%	($1,368)	($45)	-15.9%	-171.9%	-1.1%
Clarke Creek (Phase 2)	2014	Corporate Planning	$9,419	$122	18.0%	$8,057	$90	16.7%	($1,363)	($32)	-14.5%	-26.3%	-1.4%
Clarke Creek (Phase 3)	2014	Corporate Planning	$9,619	$111	18.0%	$8,193	$80	16.6%	($1,427)	($31)	-14.8%	-27.6%	-1.4%
Clyden (Phase 1)	2014	Corporate Planning	$9,679	$63	13.1%	$8,522	$15	12.3%	($1,157)	($48)	-12.0%	-76.4%	-0.8%
Clyden (Phase 2)	2014	Corporate Planning	$9,864	$196	16.9%	$8,751	$154	16.0%	($1,113)	($42)	-11.3%	-21.5%	-0.9%
Clyden (Phase 3)	2014	Corporate Planning	$10,092	$180	16.9%	$8,919	$140	16.0%	($1,174)	($41)	-11.6%	-22.5%	-0.9%
Cold Lake (Nabiye)	2012	Investment	$2,928	($177)	10.2%	$2,322	($229)	9.5%	($606)	($52)	-20.7%	-29.4%	-0.7%
Corner (Phase 1)	2014	Corporate Planning	$9,036	$83	13.1%	$8,068	$30	12.4%	($968)	($53)	-10.7%	-63.8%	-0.7%
Corner (Phase 2)	2014	Corporate Planning	$9,426	$232	16.8%	$8,433	$187	16.0%	($994)	($46)	-10.5%	-19.8%	-0.8%
Corner (Phase 3)	2014	Corporate Planning	$9,643	$214	16.9%	$8,591	$170	16.0%	($1,053)	($44)	-10.9%	-20.6%	-0.9%
Firebag	2014	Corporate Planning	$136,504	($2,199)	8.7%	$129,372	($2,419)	8.3%	($7,132)	($220)	-5.2%	-10.0%	-0.4%
Grand Rapids (2014 Corporate Plan)	2014	Corporate Planning	$1,541	($60)	10.3%	$1,399	($77)	9.7%	($142)	($17)	-9.2%	-28.3%	-0.5%
Grand Rapids (Phase 1)	2014	Corporate Planning	$7,833	($51)	11.3%	$6,822	($106)	10.6%	($1,011)	($54)	-12.9%	-105.8%	-0.8%
Grand Rapids (Phase 2)	2014	Corporate Planning	$8,452	$119	14.1%	$7,384	$67	13.2%	($1,069)	($52)	-12.6%	-43.9%	-0.9%
Kearl (2013 P&B)	2013	Corporate Planning	$104,904	($17,769)	7.2%	$100,843	($18,005)	7.1%	($4,061)	($236)	-3.9%	-1.3%	-0.1%
Kearl (De-Oxygenation)	2015	Investment	$109,566	($23,615)	6.7%	$104,207	($24,080)	6.6%	($5,359)	($465)	-4.9%	-2.0%	-0.1%
Kearl (Economic Model - CP15 FA October - CAF Reserves, YEO update, 255 in 2025)	2015	Other[3]	$63,153	($26,495)	4.7%	$54,696	($27,390)	4.3%	($8,457)	($895)	-13.4%	-3.4%	-0.5%
Kearl (Economic Model Validation)	2013	Economic Model Validation	$110,966	($16,556)	7.6%	$106,400	($16,946)	7.4%	($4,566)	($390)	-4.1%	-2.4%	-0.1%
Kearl (Initial Development Cogeneration)	2013	Investment	$122,874	($8,565)	9.2%	$114,698	($9,332)	8.9%	($8,177)	($767)	-6.7%	-9.0%	-0.3%
Kearl (Initial Development, Expansion Project, and Plant Debottleneck)	2015	Corporate Planning	$94,290	($26,508)	5.5%	$82,765	($27,423)	5.1%	($11,525)	($915)	-12.2%	-3.5%	-0.4%
Kearl (Phase 2 Expansion)	2012	Investment	$65,563	($13,286)	5.8%	$62,017	($13,460)	5.7%	($3,546)	($175)	-5.4%	-1.3%	-0.2%
Muskeg	2014	Corporate Planning	$9,096	$86	15.2%	$7,734	$50	14.0%	($1,363)	($36)	-15.0%	-41.8%	-1.3%
Rotterdam (Refinery Advanced Hydrocracker)	2015	Investment	$11,472	$1,357	22.5%	$11,423	$1,349	22.4%	($49)	($8)	-0.4%	-0.6%	-0.1%
Total / Average			**$969,953**	**($129,015)**	**13.3%**	**$899,704**	**($134,002)**	**12.7%**	**($70,249)**	**($4,987)**	**-7.2%**	**-3.9%**	**-0.6%**

Exhibit 12
Cash Flow Analysis of ExxonMobil Projects
GHG Emission Proxy Cost and Percentage Emissions Adjustment

Notes:

[1] Includes projects that were created before 2016 and that contain a GHG Emission Proxy Cost in projected cash flows.
[2] Inferred based on information provided by ExxonMobil. Models are classified as "investment" if they are labeled as "full funding" or "advance commitment" models by ExxonMobil. *See* Sources [1–3]
[3] Models cannot be classified as "investment," "corporate planning," "input," or "economic model validation," based on ExxonMobil documentation or information from the models themselves. However, ExxonMobil documentation and information from the models indicate that these models are involved in reserves assessments. *See* Source [1].
[4] Updated GHG Emission Proxy Cost basis is taken from external Energy Outlook schedules a year prior to the model year.

Sources:

[1] Exxon Mobil Corporation's Responses and Objections to the Attorney General's Contention Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, May 1, 2019, Appendix
[2] Exxon Mobil Corporation's Responses and Objections to the Attorney General's Interrogatories, *People of the State of New York v. Exxon Mobil Corporation* , Index No. 451962/2016, October 1, 2018.
[3] Letter from Justin Anderson to Kevin Wallace, *Re: People of the State of New York v. Exxon Mobil Corporation* , Index No. 452044/2018, April 12, 2019, Appendix A.
[4] Letter from Nora Ahmed to Manisha Sheth and Jonathan Zweig, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , September 28, 2018.
[5] Letter from Nora Ahmed to John Oleske and Katherine Milgram, *Re: New York State Attorney General Subpoena Directed to Exxon Mobil Corporation* , July 9, 2018.
[6] EMC 001621806, Internal ExxonMobil spreadsheets and charts on certain Alberta assets.
[7] EMC 003680301, 2016 Strategic Framing Discussion, February 8, 2016, p. 23.
[8] EMC 003697671, Internal ExxonMobil Email from Lucie Cornish, August 15, 2014.
[9] *See* Exhibit VI.2 for a list of each model's Bates number.

Exhibit 13
Cash Flow Analysis of ExxonMobil Investment Projects
GHG Emission Proxy Cost Adjustment

			Original Model			Updated Cost Schedule[3]			Difference Between Original and Updated Model				
Project, Asset, or Investment[1]	**Year**	**Type[2]**	**UCF ($mm USD)**	**NPV ($mm USD)**	**IRR (%)**	**UCF ($mm USD)**	**NPV ($mm USD)**	**IRR (%)**	**UCF ($mm USD)**	**NPV ($mm USD)**	**UCF (%)**	**NPV (%)**	**IRR (%)**
Antwerp (Europe Residual Upgrade)	2014	Investment	$6,841	$1,212	17.3%	$6,801	$1,200	17.2%	($40)	($11)	-0.6%	-0.9%	-0.1%
Aspen (Advance Commitment 2)	2014	Investment	$9,444	$497	15.6%	$8,639	$403	15.0%	($804)	($94)	-8.5%	-18.9%	-0.6%
Beaumont (SCANfiner)	2014	Investment	$2,877	$275	23.8%	$2,872	$274	23.7%	($5)	($2)	-0.2%	-0.6%	-0.1%
Cold Lake (Nabiye)	2012	Investment	$2,928	($177)	10.2%	$2,322	($229)	9.5%	($606)	($52)	-20.7%	-29.4%	-0.7%
Kearl (De-Oxygenation)	2015	Investment	$109,566	($23,615)	6.7%	$104,207	($24,080)	6.6%	($5,359)	($465)	-4.9%	-2.0%	-0.1%
Kearl (Initial Development Cogeneration)	2013	Investment	$122,874	($8,565)	9.2%	$122,075	($8,623)	9.2%	($799)	($58)	-0.7%	-0.7%	0.0%
Kearl (Phase 2 Expansion)	2012	Investment	$65,563	($13,286)	5.8%	$62,017	($13,460)	5.7%	($3,546)	($175)	-5.4%	-1.3%	-0.2%
Rotterdam (Refinery Advanced Hydrocracker)	2015	Investment	$11,472	$1,357	22.5%	$11,423	$1,349	22.4%	($49)	($8)	-0.4%	-0.6%	-0.1%
Total / Average			**$331,565**	**($42,301)**	**13.9%**	**$320,357**	**($43,166)**	**13.6%**	**($11,208)**	**($864)**	**-3.4%**	**-2.0%**	**-0.2%**

Notes:
[1] Includes projects that were created before 2016 and that contain a GHG Emission Proxy Cost in projected cash flows.
[2] Inferred based on information provided by ExxonMobil. Models are classified as "investment" if they are labeled as "full funding" or "advance commitment" models by ExxonMobil. *See* Sources [1–3]
[3] Updated GHG Emission Proxy Cost basis is taken from external Energy Outlook schedules a year prior to the model year.

Source:
[1] *See* Exhibit VI.3.

Exhibit 14
Cash Flow Analysis of ExxonMobil Investment Projects
GHG Emission Proxy Cost and Percentage Emissions Adjustment

			Original Model			Updated Costs and Emissions[3]			Difference Between Original and Updated Model				
Project, Asset, or Investment[1]	Year	Type[2]	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	IRR (%)	UCF ($mm USD)	NPV ($mm USD)	UCF (%)	NPV (%)	IRR (%)
Antwerp (Europe Residual Upgrade)	2014	Investment	$6,841	$1,212	17.3%	$6,591	$1,143	16.9%	($250)	($69)	-3.7%	-5.7%	-0.3%
Aspen (Advance Commitment 2)	2014	Investment	$9,444	$497	15.6%	$8,639	$403	15.0%	($804)	($94)	-8.5%	-18.9%	-0.6%
Beaumont (SCANfiner)	2014	Investment	$2,877	$275	23.8%	$2,872	$274	23.7%	($5)	($2)	-0.2%	-0.6%	-0.1%
Cold Lake (Nabiye)	2012	Investment	$2,928	($177)	10.2%	$2,322	($229)	9.5%	($606)	($52)	-20.7%	-29.4%	-0.7%
Kearl (De-Oxygenation)	2015	Investment	$109,566	($23,615)	6.7%	$104,207	($24,080)	6.6%	($5,359)	($465)	-4.9%	-2.0%	-0.1%
Kearl (Initial Development Cogeneration)	2013	Investment	$122,874	($8,565)	9.2%	$114,698	($9,332)	8.9%	($8,177)	($767)	-6.7%	-9.0%	-0.3%
Kearl (Phase 2 Expansion)	2012	Investment	$65,563	($13,286)	5.8%	$62,017	($13,460)	5.7%	($3,546)	($175)	-5.4%	-1.3%	-0.2%
Rotterdam (Refinery Advanced Hydrocracker)	2015	Investment	$11,472	$1,357	22.5%	$11,423	$1,349	22.4%	($49)	($8)	-0.4%	-0.6%	-0.1%
Total / Average			**$331,565**	**($42,301)**	**13.9%**	**$312,769**	**($43,932)**	**13.6%**	**($18,796)**	**($1,631)**	**-5.7%**	**-3.9%**	**-0.3%**

Notes:
[1] Includes projects that were created before 2016 and that contain a GHG Emission Proxy Cost in projected cash flows.
[2] Inferred based on information provided by ExxonMobil. Models are classified as "investment" if they are labeled as "full funding" or "advance commitment" models by ExxonMobil. *See* Sources [1–3]
[3] Updated GHG Emission Proxy Cost basis is taken from external Energy Outlook schedules a year prior to the model year.

Source:
[1] *See* Exhibit VI.4.

Exhibit 15
ExxonMobil Quarterly Institutional Holdings
April 1, 2014 to June 2, 2017

Reporting Period	Shares Outstanding	Total Institutional Holdings
Q1 2014	4,361,669,417	2,220,289,038
Q2 2014	4,333,273,520	2,203,241,243
Q3 2014	4,288,139,742	2,183,157,673
Q4 2014	4,261,070,316	2,153,407,559
Q1 2015	4,223,192,807	2,127,202,631
Q2 2015	4,206,481,567	2,108,204,129
Q3 2015	4,223,164,229	2,130,599,109
Q4 2015	4,202,291,931	2,141,240,578
Q1 2016	4,185,445,540	2,140,324,809
Q2 2016	4,182,895,478	2,172,679,815
Q3 2016	4,193,763,973	2,199,858,376
Q4 2016	4,179,692,295	2,219,482,360
Q1 2017	4,168,605,051	2,245,889,822
Q2 2017	4,268,985,084	2,249,342,863
Q3 2017	4,271,995,217	2,270,648,488

Notes:

[1] Total Institutional Holdings are the total institutional holdings of ExxonMobil shares reported by Thomson One. Due to data limitations, this total is not exactly equal to the sum of all individual firm holdings of ExxonMobil shares reported by Thomson One.

[2] Shares Outstanding is net of insider holdings, and includes short interest.

Sources:

[1] Thomson One.

[2] Bloomberg L.P.